THE

FLOATING IDEAS OF NATURE,

SUITED TO THE

Philoſopher, Farmer, & Mechanic,

A MISCELLANY,

Containing 65 different Subjects, viz.

Several new Crops and their Management.

The Firſt Volume treats chiefly on Agriculture.

On raiſing INDIAN CORN, which may be brought to Perfection in England.

On SIBERIAN WHEAT, and its Management.

On DIBBLING WHEAT, as practiſed in Norfolk, which clears 2l. 10s. per Acre above the common Method.

How to ſtock and manage 150 Acres Farm, ſo as to clear 400l. a Year.

On a general ACT to incloſe COMMONS, &c.

How to improve them by Crops that will pay the Expence.

How to manage Horſes in Stables without Litter, as practiſed in America.

By C. VARLO, Eſq.

IN TWO VOLUMES, PRICE 13s.

VOL. I.

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PREFACE.

THE preſent times of ſcarcity, or at leaſt dearneſs of corn, ſeems to ſet every engine afloat to create a change; but this is only wind, it produces nothing further than ideas, which has no effect without practice; it is in vain to light a candle and put it under a buſhel; great bodies move ſlow, multitudes may meet, appoint committees to ſcheme for plenty, but nothing is equal to precept and experience.

The Author has done more good as a ſingle inſignificant individual, by giving practical leſſons along with his works of theory, than all the authors in the kingdom could have done by theory alone; but he never directed in writing what he could not give leſſons upon, performed by his own hands.

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It is well known by numbers of noblemen and gentlemen, that tho' he has enforced into practice precepts to their ſtewards, &c. yet he never took a penny gratuity in his life, from any one.

The great progreſs in ſetting wheat, grain by grain, which is now in practice to ſo great an extent in Norfolk, Suffolk, &c. was at laſt overcome, by perſevering in the practice thereof, and is now found to be one of the beſt pieces of huſbandry extant; but notwithſtanding though it is proved paſt a contradiction to be of ſo great utility, yet it has been long gaining the footing it has got, ſo hard it is to cauſe a change from the common track, it being 32 years, (as appears by the Author's works) ſince he firſt began field huſbandry in ſetting wheat, and there is little doubt but the practice in time will become general in ſetting all other grain that ſtools and requires to be ſet thin. Should this be the caſe with huſbandry in general, it will be a great acquiſition both to farmers and labourers, as the farmer would lower the tax by keeping the latter out of work-houſes, becauſe their wives and children would be ſuited with work to their age and ſex. Could we make farmers philoſophers, they would not be long, coming into this practice, for indeed, good philoſophers will ever be found to make the beſt farmers, it being a ſcience always under their view.

Tho' the ſaid practice of dibbling is ſlow, yet the ſharp thorn of neceſſity may in time bring it general before the kingdom is arrived to the perfection of a garden, which may be the caſe before the world is at an end, ſhould that ever happen. But it is to be hoped that eſtabliſhing the growth of Indian-corn, will be much quicker in its progreſs; as moſt of the farmers in the kingdom will be ſupplied with ſeed, and books of direction at the ſame time.

INTRODUCTION.

WHAT we here preſume to offer to the public is quite foreign from matters of genius and ſpeculation. It is merely a compendium and abſtract of matters of fact, of perſonal experiments and obſervations, for a number of years; and here we deliver to you the product of all that we have gleaned, with the varying allowances and reſpective inſtructions, touching the difference of the climate, the culture, and the ſoil.

As the utmoſt of our ambition is ſimply and clearly to convey our thoughts and meaning to the ſimple and unlearned; to be uſeful to them, we muſt be as plain and intelligible as our ſubject will admit. But ſhould men of improved genius, of letters and preciſion, happen to dip into this buſineſs, we truſt, that, whilſt they look down upon authors ſo much beneath them, they will have the goodneſs to pardon the defects of writers, whoſe only aim and endeavour are to be underſtood by the farming part of the world. But if here and there they ſhould find any thing deſerving their particular attention; if they ſhould find ſome grains of wheat in the midſt of our chaff, or ſmaller particles of gold in our droſs, the honour of having contributed in any meaſure to their advantage, will be to us a high matter of payment and gratification.

And if the ingenious reader can improve upon any hints, he will be the more praiſe-worthy. The field of improvement is large enough for every one to try his talents in. A man muſt know much, to know every thing; a general knowledge is deſired by many, but obtained by none. In ſhort, every ſtep that leads to knowledge, or improvement, is worthy of being marked with laurels of gold.

Our great Creator, for good and wiſe purpoſes, has diverſified human nature with as many degrees of underſtanding, as there are external ſhapes in the body, and linked us ſo together, that we cannot live without the aſſiſtance of each other.

The political government is as much dependent upon the mechanical artiſt or day-labourer, for a ſubſiſtence, as the latter are to them, for any judgmatical laws they may enact, for regulating the multitude of individuals under their care.

The political ſyſtem may be compared to the movement of a watch, the legiſlative power the main ſpring; ſhould they enact ſuch laws as are oppreſſive; or, on the other hand, omit thoſe that would be uſeful to the community, if enacted, it would cauſe ſuch a contraſt in nature, as would diſorder the whole ſyſtem.

Though we doubt not but the political abilities of our legiſlature are adequate to that of any other body of men in the known world; yet, experimental knowledge, acquired by induſtry and attention to buſineſs, is very often wanted to plan uſeful laws.

It matters not from what fountain uſeful knowledge ariſe, whether from a yeoman, churchman, or a court politician; they ought for conſcience ſake, to be taken notice of, encouraged and enacted according to their merit, as much as if they roſe from the firſt miniſter of ſtate; and as we think it a duty incumbent upon every individual, to communicate to the public, any uſeful thoughts that may ariſe, we flatter ourſelves, we ſtand excuſed for drawing up and publiſhing the following ſchemes; and though they may not all meet with a general approbation, yet we truſt, they will be approved of by the unprejudiced ſenſible part of mankind.

A hint to the wiſe is ſufficient; therefore it is enough to ſay, that the following ſchemes are only meant as outlines, or hints to be improved upon. It would ſwell this work beyond the bounds intended, were we to enlarge upon the merits of every ſcheme, or lay down every neceſſary clauſe, binding to an enacted law; this we leave to the correcting pens of thoſe who are judges in ſuch matters, and doubt not but they will improve upon the hints, and clothe them out to the beſt advantage; it will alſo be a meritorious act, and reflect honour upon every voice and pen, that aſſiſts in bringing them to maturity for public utility; and likewiſe merit the thanks of the authors, who have ſpared no pains in giving them birth, though they expect no other advantage therefrom, than what may flow to every individual, by wholeſome and conſtitutional laws being enacted.

FLOATING IDEAS OF NATURE.

CHAP I.

On the White Vetch.

THE white vetch, in ſome degree, partakes of the nature of a white or boiling pea, as it will boil ſoft and ſmooth like that grain; and is chiefly uſed for making puddings; it is mild, good, and palatable; conſequently very proper for that purpoſe.

It only differs from the common vetch in colour, which is milk white, but the ſhape of the grain and the ſtraw are alike; however it will not ſtand the winter ſo well, being of a tender nature.

The proper time to ſow it, is in April. It thrives beſt in light ſandy land, and ought to be ſet in drills, and hoed; if it be managed thus, it will produce a great return.

CHAP. II.

On the Siberian, or naked Wheat.

THE naked wheat is a native of Siberia, a very barren and cold climate. The land is covered with ſnow nine months in the year; conſequently there are only three months to till, ſow, and reap in.

Their chief ſupport of corn, is this naked wheat. This grain partakes of two ſpecies, viz. wheat and barley; one ſide of the grain reſembles the former, and the other the latter.

It is a very quick grower, and lies but a ſhort time in the ground before it vegetates.

It is a full plump corn; about five hundred grains weigh an ounce; therefore it is about one ſixth bolder than Engliſh wheat.

It comes up with a very broad, ſtrong, healthy blade, owing to the largeneſs of the grain, and the quantity of nitrous particles it contains. The ſtraw is as ſtrong or as groſs as that of wheat, and the grain grows in a chaff like it.

As it partakes of the likeneſs, ſo does it of the quality, of both wheat and barley, for it makes good bread, and good drink, and the ſtraw is as ſoft as that of barley.

In order to prove its value more particularly, a buſhel was ground and made into bread; twelve pounds of wheat ſeconds, were made into a loaf; and a like quantity of this Siberian wheat was alſo made into a loaf, and both put into one oven. When they were baked, the Engliſh wheat loaf weighed fifteen pounds, and that of the Siberian eighteen; and the bread of the latter was as good as that of our Engliſh wheat; neither does it produce half the quantity of bran as common wheat.

There are two ſorts of this Siberian wheat; one has a flat ear with only two rows, like that of flat, or what is called battledore-barley; the other has ſix rows in one ear, and the grain in them much ſmaller than that in the ear with two rows. Both ſorts are bearded like barley.

One buſhel was malted and made into ſmall beer and ale, both of which were very good and pleaſant to drink; and it was found to produce a greater yeld than our common barley; perhaps owing to its thin ſkin, and fullneſs of flour.

In 1767, a nobleman brought from Siberia one pint, and gave it to the Society of Arts and Sciences.

Thoſe gentlemen judged from the look of the grain, and from the nature of the country and climate it came from, that it would be of great utility to England, could a quantity be raiſed ſufficient to ſeed the kingdom.

Upon which they divided their ſmall portion among ſuch perſons as they thought would be induſtrious and careful enough to make the moſt of the produce.

A common wine-glaſs full was given to Mr. Halliday, of Liverpool, half of which he gave to another gentleman.

Mr. Halliday, like a faithful ſervant, did not hide his talent in a napkin, but by proper judgement and induſtry, he ſowed and made it thouſands, and tens of thouſands, as from this ſmall quantity has ſprung, in the four laſt years, many hundred buſhels.

The Rev. Mr. Meredith was not idle in this public-ſpirited undertaking. He procured a quantity from Mr. Halliday, and divided it among ſuch of his acquaintance, as he hoped would propagate it to the beſt advantage.

He was ſo kind as to ſend one buſhel to the Editor; but he had not an opportunity to do it juſtice, which was owing to a diſappointment occaſioned by the neglect of carriers.

However, as ſoon as it arrived, on the 7th of June, he trench-plowed a piece of bad land, covered with heath and other rubbiſh, and which had lately been incloſed from a common.

On this it was ſowed, and notwithſtanding all diſadvantages, it was a tolerable good crop, and much better than any ſort of Engliſh grain would have been, had it been ſowed on the ſame land, and at the ſame time of the year.

The Editor received a few grains from another hand. This was ſet in a proper ſeaſon, and upon good land, each grain at a foot aſunder, which gave a produce of about two thouſand fold.

In ſhort it is a great multiplier; for though it will grow better than other grain upon bad land, yet if the ground be good, it will ſtool out, and flouriſh in proportion, but the greateſt care muſt be taken not to over ſeed the ground.

The proper ſeaſon for ſowing it, is about the beginning of April. Trench-plow the land to ſmother the weeds, and raiſe a good deep mold.

Then harrow it well, but with care, not to drag up the ſods or weeds with the harrow pins.

Being thus prepared, ſet your Siberian wheat with a dibble or ſetting-ſtick, and make the holes at one foot diſtance from each other; into each hole put three grains, and let the land be of what degree of richneſs it may, doubt not but nature will force out ſtooling branches ſufficient to fill the ſurface of the earth, and give a greater produce than if you crowd the ground too much with ſeed.

About twelve pounds of naked wheat will ſeed an acre, and thirteen pounds and a half of Engliſh wheat will ſet an acre likewiſe, and ſo on in proportion for every ſort of grain, according to the largeneſs of the ſeed.

After the ſeed is ſet, cover it, by filling the holes with a rake. One man will cover at leaſt two acres in a day, by this method; and if you pleaſe, you may ſow graſs-ſeeds before the ground is raked, and be aſſured they will grow, and thrive better amongſt corn thus regularly ſet, than if ſown promiſcuouſly in the common method.

FLOATING IDEAS OF NATURE.

CHAP I.

A few Hints offered for the Peruſal of the Freeholders in general, how to chuſe a Member of Parliament.

GENTLEMEN,

THE ſchemes in the following ſheets are humbly offered for your peruſal, as the firſt principles of their efficacy, if put in execution; the legiſlature is the executive body to enact laws, but you, as freeholders, are the electors of that body; therefore, ſhould your choice fall upon unworthy men, deficient in abilities, and, in other reſpects, unfit for the important ſeat they are to the fault is yours, as you muſt run into ſuch errors with your eyes open; becauſe, every gentleman, qualified to ſit in the Houſe of Commons, ought to be a man of eminence, whom the eyes of the world are upon; common fame generally points out his worth and abilities; therefore, ſuch a-one cannot, or at leaſt ought not, to be a ſtranger to his neighbouring freeholders, whom he is to repreſent; and if you chuſe a ſtranger, who acts not up to your wiſh and expectations, you are inexcuſable.

It is natural for maſters or employers, through all ſtages in life, to be well acquainted with the talents or abilities of thoſe whom they employ, whether they are qualified or not for the truſt and confidence repoſed in them.

Then certainly you, as freeholders, who have the chuſing of the legiſlature, a power ſuperior to all others, ought to be very circumſpect whom you admit into that high office, as the happineſs or miſery of ſuch a multitude of people depends upon the laws they are to enact; therefore, their abilities, experience, and paſt conduct, ought to be ſtrictly enquired into.

Pardon us for pointing out, what, perhaps might pleaſe, ſhould ſuch fall to your lot. He that is truſted with the affairs of the nation, ought to be every thing that is great and good; he ſhould have an honeſt heart, ſound judgment, a noble ſpirit, and be a lover of his king and country; neither ſhould he be a ſtranger to his own country, as is too often the caſe with gentlemen who travel abroad; who, being aſked about the conſtitution or commerce thereof, can ſcarcely give a rational anſwer.

If a gentleman has his country's good at heart, and would wiſh to ſerve it from laudable and generous principles, he ſhould travel through it, at leaſt three or four years, and be very particular in his remarks and obſervations, in order to gain experience to enable him to plan conſtitutional laws.

Add to this, he ſhould have the patience of Job, to hear all debates; the wiſdom of Solomon, to judge of them; the reſolution of St. Paul, to plead in their behalf; and dare to be honeſt, in the worſt of times, to his king and country.

Let me, therefore, adviſe the conſtituents to conſider well the abilities of thoſe who repreſent them; not to be led away or biaſſed in their opinions, by pomp, ſhow, bribery, or fine words. It is mean, and below the noble ſpirit of man to be led by the noſe like a bear.

Scorn to take a bribe; let all the world ſee, that you, as free men, are endued with a more generous and open ſoul, than to ſell your freedom, and debaſe your underſtanding, even for a dinner or a treat: be not like Eſau, who ſold his birth-right for a meſs of pottage.

What man of ſpirit or generoſity would lay under an obligation to a gentleman for a paltry treat? and he that takes a bribe, is a villian to his country.

There are few men who are qualified to give a vote at an election, who are not alſo able to treat themſelves; and conſider, that a thing of the ſort is ſcarce felt when it is divided among a great many; but being added, and paid for by one, is too heavy a burden for him to bear, though a gentleman.

Let it be alſo underſtood by every one, that he who buys a man will ſell him; nay, he has a right ſo to do; for what he buys, is his own, both by law and equity.

If you GIVE him your vote and

intereſt, you then lay HIM under an obligation ; he would then ſerve you from a fellow feeling ; it would be the greateſt of ſins, that of ingratitude, to deceive you ; he would make your intereſt his own, and give his voice to enact every uſeful law for your intereſt.

But how, in the name of wonder, can you expect it from a gentleman, who has ſpent, perhaps, from one to twenty thouſand pounds for a ſeat ? the immenſe expenſe and trouble he is at, thwarts and ſours his temper ; and, perhaps, out of revenge, and even contrary to his own judgment, he will give a caſting voice againſt what might be of public uſe if enacted : ſuch bas been known.

In ſhort, a man who has ſpent a great part of his fortune to gain a ſeat, will take long ſtrides to retrieve it ; and, in his own mind, ſtands ſelf-excuſed, for any unconſtitutional ſteps he may take for ſo doing.

Self-intereſt is a prevailing argument, and may often whiſper things to quiet a man's conſcience, which he thinks himſelf not accountable for to the world.

There are two ſorts of men, who, though not proper for a ſeat in the houſe, yet generally ſtrive to get in it; one for ſelf-intereſt, and the other for oſtentatious pride.

The former ſpends, or rather wears his money well; for, by procuring a ſeat, he, at the ſame time, has an eye upon ſome advantageous place; therefore all his pretended zeal is ſelf-intereſt.

The latter buſtles and ſtrives hard for a ſeat, and talks of what great feats he can perform, if you chuſe him for your repreſentative; perhaps all his pretended zeal is pride: it has become a great thing to be a parliament man, and he will be that great man, coſt what it will; he will not be outdone by any one ; he has money enough, and ſure that is ſufficient to make any man great, let his other accompliſhments be what they will.

But do you think ſo, our experienced readers ? no, certainly : you know better ; you are ſenſible that greatneſs originates from true manly wiſdom ; and this is acquired only by dint of induſtry, and cloſe application to buſineſs and ſtudy.

Though a man with a large fortune may be born with natural mother wit, yet it takes a great deal to make him what we may call, a clever, ſenſible, great man.

His large eſtate, in ſome degree, is a bar to thoſe acquirements, as he reſts ſecure in his independent fortune.

What little time there is to ſpare, in his youth, from the gay pleaſures of a crouded world, is little enough for the firſt rudiments of education ;

when he arrives at manhood, he is immediately ſent abroad to finiſh it, by travels into foreign countries, in which he ſeldom learns any thing that is of real ſervice to himſelf, as a parliament man; though, at his return, he is immediately uſhered into the houſe, without his conſtituents having any real knowledge of his experimental abilities; indeed, experience he can not have, particularly of his own country, where it is moſt wanted.

We have no party views, but wiſh well to all men; and though ſuch, as above, may be very worthy, ſo far as their knowledge leads, yet the odds are greatly againſt them; for, ſuppoſe a man's natural parts be as great as his fortune, reaſon tells us, that it is experience which begets wiſdom, and that, is not acquired without great induſtry, and application to buſineſs: the more troubles and hardſhips a man wades through in the journey of life, the more valuable is his experience.

It is the ſharp thorn of neceſſity that ſpurs on the mind, and puts ingenuity to the rack; and, as it were, forces out thoſe ſeeds of invention, which might lie hid in one, who glides ſmoothly and ſecurely through an uninterrupted courſe of life, which is the effect of an independent fortune.

It requires little ingenuity for a gentleman to ſpend a fortune; any fool can do that; but he is a clever fellow that can make one, out of little or nothing to begin with.

The man who is proper to be at the head of affairs in a mercantile country, is he, who, by the dint of ingenuity and induſtry, has made his own fortune; who has ranſacked every corner of the kingdom for materials to build it upon; and whoſe buſineſs has thrown him into different companies, where various converſations may be heard, which open the ideas, and ripen the underſtanding.

Man, in his natural ſtate, is a very unpoliſhed, rude, uncouth creature; the ſoul is implanted in him for noble and wiſe ends; but it is confined from ſpreading, ſprouting, or growing up to maturity, as the ſeed in dry barren land, and makes little progreſs to improvement, till cultivated by art.

Neceſſity begets induſtry; induſtry ingenuity; and ingenuity begets experience and wealth; but, as before obſerved, a man born with a fortune, is, in ſome degree, exempted from theſe valuables; as he has the chief ſpring to action, namely money, provided to his hands.

At the firſt inſtitution of parliaments, the members were paid a certain ſum, or modus per day, by the boroughs or counties they repreſented, for doing their conſtituents buſineſs.

ſineſs. Pickering, in Yorkſhire, was formerly a borough town, and ſent two members to parliament, but loſt their charter, becauſe they could not afford to pay them each a noble per day; a ſum allowed by charter, as a conſideration for the members tranſacting their buſineſs.

This ſhews a ſtrange alteration between times in the purity of the primitive age, and thoſe in which we now live.

In the former, members were paid for doing the public's buſineſs, which had ſome meaning in it; but now they pay ſeverely for being admitted ſervants to the public, which would puzzle a conjurer to know the meaning of.

It aſtoniſhes us greatly, to think how it is poſſible for ſuch a body as that of the legiſlature, to overlook ſo many uſeful laws, as might be enacted for public utility: that ſome one or other of them ſhould not find them out, or ſhould ſtumble over every thing that is valuable: but it verifies the old ſaying,—what is every one's buſineſs, is no one's.

It is to be hoped, every one who reads the ſchemes contained in the following ſheets, will give all the aſſiſtance in their power towards procuring all, or ſo many of them enacted, as reaſon points out to be uſeful; and we flatter ourſelves, they will be really ſo, more particularly, as we are ſtrengthened in our opinion by a worthy gentleman of conſequence and preciſion, who has read them in manuſcript, and much approved of them; therefore adviſed them to be printed for public peruſal, that every one might lend their voice, where reaſon points the way.

It is not to be expected that the following ſchemes, in their preſent dreſs, ſtand correct, or are a true plan of what they ſhould be, were they enacted into laws; they are only meant as hints or out-lines, to put the legiſlature in mind, that, if they think them worth their notice, they may make ſuch alterations or deductions, as, in their wiſer judgment they may think proper.

It is the height of our ambition that they take notice of our hints, and pick and cull the gold from the droſs; for, ſuppoſe a few, out of many individuals, to be bettered by them, it will be a matter of high payment and gratification to thoſe who have ſpared no pains or expence to be uſeful to the public.

CHAP. II.

Shewing the great advantage that would accrue to the Public, was a General Act made for incloſing all Commons, Foreſts, or Waſte Lands.

OF all the ſchemes that have been hitherto ſet on foot, for lowering the price of proviſions, we apprehend none looks ſo plauſible, for that purpoſe, as a general act for incloſing commons and all waſte lands, which would certainly be of great utility to the public.

In the year 1772, the public were agreeably amuſed for a while, with a ſcheme ſet on foot, by ſubſcriptions in Briſtol and London, which was, to reduce the price of proviſions, relieve the poor, &c. but though the deſign was a public-ſpirited and laudable undertaking, yet a little reflection muſt convince every rational experienced perſon, that it could not anſwer the end, ſo as to be of great utility.

It was very unlikely that a few individuals, though rich, could cauſe a change among ſuch a multitude of people as England contains; this, reaſon might dictate, and experience quickly proved it; for it ſoon died away, and came to nothing, without any ſenſible good effect to the public; perhaps a few poor in the neighbourhood where the thing happened, might gain a trifle for a time, but it was a mere trifle indeed, in compariſon to the whole.

Yet, little as it is, when the fund drops, as it naturally muſt, (for all the public charities in England could not keep it up) it leaves the poor in as needy a condition as ever; nay, perhaps worſe; for it may have diverted them from applying ſo cloſe to induſtry as uſual; and which they muſt do, though againſt their wills, upon the ſtoppage of any ſuch public charities, which ſeldom hold long, when dependent upon the voluntary contributions of the donors.

If we would wiſh a public good, we ſhould aim at a general undertaking; many hands make light work, is an old proverb; raiſe an univerſal emulation among the people, allure them to improvements, by voluntary acts in themſelves, which promiſe each individual profit, and conſequently, a public plenty.

This is moſt likely to be effected by two ſchemes; firſt, by enacting ſuch laws, as may make it the intereſt of each, to apply himſelf to induſtry.

Secondly, by ſtriking out proper plans for improvement; which, if plauſible, will of courſe be followed with rapidity, whether in a mercantile way, to gather wealth from the Indies to decorate the external parts, or to our own fields, to raiſe food for the needy populace; and ſince the ingenious enterpriſing ſpirit of the times has brought home ſo much riches, as to give the balance of power in favour of the former, it is now become abſolutely neceſſary to bend the minds of the public to the latter, till every corner of the kingdom is ſo well tilled, as to admit of no more improvement; then it will be time enough to emigrate into a foreign country, to improve that alſo; but as, perhaps, one-fourth of this little iſland is yet a barren waſte, it will be ſome time before improvement can be at the greateſt height.

It would, doubtleſs, be a great

ſatisfaction to the public, as alſo a guide for the legiſlature to go by, were they truly informed, how much common or waſte land remains unimproved, which may eaſily be attained, by the methods laid down in a table annexed to this work; put that plan in practice, and it will give a thorough idea of the ſtate of the kingdom in all the moſt important points neceſſary to be acquainted with.

Till then, we can have no certainty how much of the kingdom lies waſte, in commons, *&c.* It is judged by many, that, at leaſt, one-fourth lies uſeleſs; which, perhaps is a moderate computation; if this be the caſe, was it improved, it would add to the kingdom one-fourth more riches, proviſions, and alſo, ſtrength to guard againſt an enemy; as a farm houſe would be quickly built to accommodate each proper quantity of land, conſequently the whole would be inhabited

bited with a number of people adequate to the tillage or improvement of the ſame.

Here we ſee, at one view, the great advantage that would accrue to the public: firſt, it would be a means of keeping the people from emigrating to the wilds of America, as they would then have liberty to cultivate the waſtes in their own country; and it is well known, that the riches and ſtrength of an iſland or kingdom, depends upon the number of its inhabitants; they alſo add treaſure to the public funds, as a duty is paid for almoſt every neceſſary of life, whether meat, drink, or apparel; therefore we may ſay that a man, his wife and eight children, adds ten treaſures to the public funds, ten portions of ſtrength to defend the kingdom, and ten hands to till the ground; which will bring in the end, ten times as much to the market as a ſingle man; conſequently, they are of ten times the utility to the public; and yet, many farmer's ſons, are withheld from marrying, through the ſcarcity of farms to ſettle upon, which would be, in a great meaſure, removed, was a general act to take place for incloſing, and another for limiting the ſize of farms.

Let weak heads argue to the contrary, if they will, but theſe are facts that cannot be controverted. We have many a time heard wrong heads argue againſt incloſing commons or waſte lands, the foundation of whoſe arguments are as weak as their underſtandings; however, though weak, they may ſometimes do hurt, by throwing cold water upon uſeful ſchemes.

How often do we hear and ſee ſcriblers and talkative men exclaim againſt incloſing commons; that it ſtarves the poor, depopulates the country, *&c. &c.* whereas, take the argument to pieces and examine it, point by point, and it will be found quite the reverſe; for commons abſolutely keep the people poor, and are an inlet to roguery and idleneſs.

It is an undeniable fact, that thoſe people who live in villages, near, and depending upon, commons, are the pooreſt in England; and, indeed the thing ſpeaks for itſelf; becauſe every labourer and ſervant, that can, will flock to ſuch places, to gain ſettlements, and take a common-right houſe, which intitles them to keep ſtock thereon: after this, perhaps, they raiſe a cow, and a few ſheep, on which is the dependance for a wife and children to live upon. Not being half ſupplied with work, (as little is to be got in ſuch places) their chief dependance is, the milk of a half-ſtarved cow, and the produce of a few ragged, half-ſtarved ſheep, which are generally taken off once in every two or three years by the rot; this brings the owners either to the pariſh, or to beg or ſteal, and at laſt, perhaps, to the gallows; for moſt of the horſe, cow, and ſheep ſtealers in the kingdom, are bred in ſuch places as are near commons.

Theſe are the general conſequences which attend people adjoining commons; if the land they conſiſt of be naturally good, it is ſo much over-ſtocked, that it is pitiful to ſee how much the cattle are ſtarved, and prevented from coming to their natural growth.

If the land be heathy and barren, the few ſtock it keeps, are poor, ſmall, dwarfy, and of very little conſequence, either to their owners, or to the public, by adding to the funds of proviſions.

Though the above is literally true, was it ſo but in a ſmall degree, the effects thereof would not be ſo ſenſibly felt by the public; but dreadful it is, when we conſider, that no leſs than one-fourth part of the kingdom lies locked up from the public, in this barren neglected ſtate.

It is ill policy, nay, it is inſolence and folly to the higheſt degree, not to take away this bar to improvement, and, by a general act, make it lawful for all commons and waſtes to be incloſed; becauſe, of conſequence, improvement and plenty of proviſions would ſoon follow.

What can a foreign traveller ſay, upon ſeeing ſo much waſte grounds as we have in England? he muſt naturally conclude, that there is ſomething defective, either in our laws, or ſpirit of improvement; or that our hiſtorical maps, &c. are erroneous impoſitions upon the public, by deſcribing the kingdom much larger and better peopled than it really is, or elſe we could not ſpare ſo much land to lie barren; conſequently unpeopled; and yet the people are emigrating, to improve a new world.

It would be true policy, to take away every bar, and to give every poſſible encouragement to improve our own kingdom. Firſt, ſhould the hive be too ſmall to contain the ſwarm, let them, like the induſtrious bee, caſt, or turn out, to enrich her common-wealth elſewhere.

Of all the evils before us, we ought to chuſe the leaſt; and would be glad to know, what ill conſequences could ariſe from ſuch a general act, ſhould it take place?

Perhaps a parcel of weak, ignorant farmers, who love to ſee a quantity of dwarfy, half-ſtarved cattle, may exclaim againſt incloſing; but they are only hurt in idea, by thinking, that they could not live without commons; however, let ſuch look into the ſtate of the pariſhes that have none, and they will find there, much richer and happier people, perhaps, than themſelves; therefore, little regard ſhould be paid to ſuch imaginary evils, and ſhort-ſighted men; they are not worthy a thought, in compariſon of the many good conſequences that would ariſe from ſuch a public act taking place.

Again: repeated experience tells us, that a general incloſure muſt be a general good, from the many private acts that are procured every ſeſſions of parliament for that purpoſe; which are no ſooner obtained, but the land is incloſed, improved, built upon, and inhabited; ſure this is a leſſon that any one may run and read; but though ſo many private acts are daily procuring, it is only half doing the buſineſs; it is ſlow in its motion, and is a very great clog upon the wheel of improvement, as the trouble and expence it coſts to procure an act of parliament, would go a great way towards improving the land, whereas, a general act would avoid this, by doing all at once.

Should ſuch waſte lands not be immediately all improved, from the immenſe quantity there is, yet no ill conſequences could ariſe therefrom, as they cannot grow the worſe for lying 'till the induſtrious hand reaches them, which, in the nature of things, could not be far off, if we may judge by a little what much means; for now-a-days an act is no ſooner procured, but the common is improved, and perhaps, built upon.

CHAP. III.

Upon limiting the Size of Farms.

IF an act of parliament was to paſs, in order to put a ſtop to the monopolizing of land, and to limit the largeſt farms to four hundred acres each, it would doubtleſs have a great tendency towards making improvements flouriſhing, and plenty abound through the two kingdoms.

It would then be in the power of every one, to make the moſt of his ground; no corner of it would eſcape his eye, and lie barren. He would improve every part, and fill it with one profitable crop or other.

It is the nature of man, in all ſtations of life, to be aſpiring, and very often to graſp at what he is not well able to manage.

But in no caſe is the misfortune more ſenſibly felt, both by the party concerned, and by the public in general, than when a farmer holds too much land.

But ſuppoſe the farmer can ſtruggle thro' and pay the rent, yet the public is ſtill a loſer? as the earth does not produce half the increaſe it would do, were it managed to the height of perfection.

Therefore, ſuch laws as theſe would lay the foundation for plenty; and only ſuch, can make the people happy and honeſt.

May we not compare a kingdom to a family? Is it not the firſt care of a maſter to provide bread for his family? If he neglects this, can he expect that his ſervants will be honeſt and induſtrious?

Are not the king and the legiſlature the fathers of the people? Are they not impowered to enact ſuch laws as may appear to them to be moſt for the public good? Are there any that ought to draw their attention, before ſuch as would ſatisfy the firſt law of nature?—Hunger will break through ſtone walls.

What good has accrued from all the laws which has ever been enacted, to prevent foreſtalling? Do they ſatisfy the people's craving appetite with bread? or make it one jot cheaper? Do they add one peck of corn to the mill, or tend towards making one blade of corn more to grow?

It is inconſiſtent with reaſon they ſhould. In ſhort, were ſome of theſe laws put in force, they would have the contrary effect; becauſe they would cramp trade, which, like water, is the beſt leveller.

What would London and all our great ſea-ports do, were it not for the corn-factors, wholeſale butchers, drovers, or dealers in cattle, *&c.* It is ſuch as theſe that keep an equality in prices throughout the kingdom. They buy where ſuch commodities are plenty, and ſell where they are ſcarce. Is it to be ſuppoſed that a farmer or grazier, who has perhaps no more than twenty quarters of corn, or three or four fat cattle to ſell, and who lives a hundred miles from London, could go there to ſell them? And ſuppoſe he did; muſt he not lay a greater price upon them, to anſwer ſuch extraordinary expences? And would not this moſt ſenſibly affect the lower claſs of people?

The merchant's ware-houſe may juſtly be called a magazine for the poor, where they can apply for ſuch neceſſaries as they ſtand in need of. Neither have the poor caſh, or means to provide long before ſuch things are wanted.

It is the merchant's intereſt to lay in his commodities in the time of plenty, and to ſell out in time of ſcarcity. Is not this a natural policy, that will keep things moſt upon an equality? Was not this the caſe with Joſeph? He filled his ſtores in the times of plenty, and ſold when they grew ſcarce, for he did not give his proviſions away any more than our merchants do.

Moſt of the commodities or neceſſaries for life are periſhable, therefore, under a neceſſity of being diſpoſed of before they ſpoil. Should any one be ſilly or indiſcreet enough to keep them too long, he is puniſhed by his own folly; but this very ſeldom happens.

The merchant, with a capital and ware-houſe proper for the occaſion, is a ready market for the farmer to fly to, for the ſale of his crops.

Had he not ſuch a reſource, he would be deterred from ſowing, which would be the firſt ſtep towards a famine.

Theſe are all conſequences which muſt naturally happen, were the acts to prevent foreſtalling put in force. For every perſon that buys before the goods are brought to market, is in reality a foreſtaller, as the law now ſtands.

We may remember ſeeing many hints in the newſpapers, relating to fat cattle being returned from the markets in London to the country unſold; and at the ſame time wiſhing for ſuch laws as would enforce them to be ſold, and not returned.

Certainly ſuch authors judge as ſuperficially of thoſe matters, as the old-faſhioned farmer, who for ſome time paſt, has ſtuffed the papers with his ſilly arguments, wherein he takes upon himſelf to prove to the public, that it was the incloſing of commons, together with turnip huſbandry, which was the cauſe of dearneſs of proviſions.

In one of his letters, about Martinmas, he thanked providence for a *miſ-crop* of turnips. For, ſays he, as this crop has failed, farmers are obliged to bring their ſheep and cattle to market; which has lowered butcher's meat greatly. But, perhaps, he is one of the tribe of ſleepers, which only want food one half of the year; the other, they live in a ſtate of inſenſibility without it. His ſhort-ſighted underſtanding could not find out what would be the conſequence; that the more they killed in autumn, the fewer remained for ſlaughter in the ſpring; that we cannot both eat our cake and have it.

When winter food falls ſhort, (of which turnips are the beſt) the cattle muſt walk to market with their bones half loaded with fleſh; conſequently,

ſequently, the poor muſt go with half a belly full.

The old-faſhioned farmer's reaſoning upon the incloſing of commons, is much the ſame; for he does not ſee the many thouſand acres in the kingdom, which in their wild ſtate will not keep a rabbit on an acre; whereas, if incloſed and improved, they might be made to keep four or five ſheep per acre. And certainly the more live ſtock there is bred in the kingdom, the greater chance we have for plenty; becauſe in the end, they muſt come to the butcher, except turnips and other winter food fail. Then, indeed, the cattle may die for want, and the poor may ſew up their mouths.

It is paſt a contradiction, that the more waſte barren land there is incloſed and improved, the more ſtock and corn it will raiſe. All which tends to plenty; becauſe every article that keeps nature alive, ſprings from the earth; conſequently it ought to be our firſt care to make her produce abundance.

But to return to the farmers, ſaleſmen, and butchers; (theſe are repreſented as unmerciful men by authors in the news-papers, who want ſome laws to make them kill the cattle when brought to market, whether it be conſumed or not,) we humbly conceive ſuch laws would be very pernicious, and put a ſtop to the balance of trade, which, inſteàd of going on ſmooth and even, would be continually upon a flux and reflux. It would be like a weigh-pole, which children ride upon, always up and down, riſing and falling; becauſe ſome weeks there would be twice as much cattle in the market as is neceſſary for the inhabitants to conſume; therefore, the meat would be ſold very low, or thrown away, and perhaps both.

The next market-day, there might not be half the quantity of cattle as was wanted, conſequently the meat would be double the price. In this caſe the rich could buy, but the poor might ſtarve.

Experience ſhews to the butchers, not only in London, but all over England, how much meat each market will take off.

Each knows what he killed laſt week. which was perhaps as much, or more than he could ſell; therefore he will kill no more this week, leſt it ſhould lie on his hands.

Before ſuch laws ſhould take place, it would be neceſſary that the farmers ſhould be endued with the ſpirit of prophecy or fore-knowledge; that he in the north might know on what day he in the ſouth, at ſeveral hundred miles diſtance, would ſend his cattle to the market, leſt they ſhould claſh with each other, and overſtock it.

In ſhort, we are of opinion, that it is as neceſſary to ſend cattle out of the market, when over ſtocked, as to bring them to it when ſcarce; conſequently, the drawing farms near London, or great markets, are very uſeful, and may be conſidered as a ſort of make weight, ready to throw into the riſing ſcale, as it were, to keep a balance.

There is another ſet of people, who exclaim againſt farmers for withholding their cattle from the market; as if that contributed to the dearneſs of proviſions.

But theſe notions, like the reſt, are ill grounded. Every one that judges rightly, muſt know, that it is not the huſbandman's intereſt to keep back from market his cattle, after they are once fat; for when they come to the height of perfection, all the food they eat is thrown away; and the intereſt of the money is ſinking. It is the intereſt of every one in trade, to make as quick a return, as poſſible; therefore it is plain that it is the grazier's intereſt to ſend his cattle to market as ſoon as they are fat.

And on the other hand, the public can loſe nothing by their being kept away from market, till they are fat; becauſe every pound they gain in weight, is adding to the public fund of plenty; the more pounds a bullock gains in weight, whilſt he ſtays from the market, the more bellies he will fill when he arrives there.

Upon the whole, it is bad policy to cramp trade in any branch, much more in that which concerns the cravings of nature.

The moſt prudent ſtep would be, to lay a foundation for plenty, and there is no doubt but that nature will produce enough to ſatiſfy her dependants. As to things being dear, it is a natural cauſe, which ariſes from money being more plentiful, as before hinted; and not from any real want, or decreaſe of proviſions.

It is not improbable but that in proceſs of time, wheat may riſe to five ſhillings a peck, by gradual ſteps, for the ſame reaſon as it has roſe from one penny to 2s. 6d. a peck; and every other commodity in proportion.

CHAP. VII.

On the Art of making light Land heavy, and heavy Land light, by the newly diſcovered valuable Method of Trench Plowing, and by which any ſort of Ground may be kept in perpetual good Order, ſo as to produce good and clean Crops for ever, without any other Aſſiſtance of Fallow or Manure than what itſelf produces, &c.

HOWEVER marvelous this valuable method of trench-plowing may appear at the head of a chapter, yet ſtrength of argument and experience gained from many trials, prove, beyond a contradiction, the truth thereof, and that its utility extends alſo to every ſort of land, though indeed ſome may perhaps receive more benefit from it than others, yet every candid reader, who will diveſt himſelf of partiality, and liſten to plain reaſon, will acknowledge the great utility that may ariſe by this valuable method, particularly as the firſt care of all judicious farmers are to make heavy land light, and light land heavy, in order to temperate both extremes to a friendly loam, (which is the beſt corn mould) there is nothing equal to trench-plowing, and mixing clay with ſand, and ſand with clay, where each ſoil is predominant.

It may not be amiſs to make a diſtinction between trench-plowing and deep plowing, as they may both ſeem to convey the ſame meaning, though in fact both the method of performing the work, and the produce in the crop, are quite different.

Deep-plowing is meant, when

the plowman turns up a thick ſod, and leaves a deep furrow or trench behind, which is generally practiſed when a farmer ſees his land over-run with weeds, (expreſſed by him dirty, which, by the by, is too often the caſe) his method then is to plow deep, to bury the weeds.

By the word bury, we naturally ſuppoſe he concludes them (as they certainly are) deſtructive to his crops, by feeding upon his labour; therefore, as well as he knows how, wants to ſtop vegetation by burying, ſmothering, or killing them under a large body of earth.

Repeated experience tells him, that this method of deep plowing in ſome degree lowers the number of theſe troubleſome enemies, which if not checked by this or ſome other method, would entirely poſſeſs themſelves of his ground, by rooting out, ſmothering, or choaking any crop he threw therein.

Now if we find by experience, that deep plowing is in ſome degree uſeful, by deſtroying part of ſuch rubbiſh, it naturally follows, that their entire deſtruction would redouble the ſucceſs in our crops; however, by deep plowing alone we cannot expect this advantage; for though the ſod be turned ever ſo thick, yet as it rears againſt another ſod, and lies hollow, it admits a circulation of air, which keeps vegetation alive, and forces up a mane or row of graſs or weeds in the ſeams between each furrow; therefore, it is merely impoſſible to kill every ſort and part of weeds, ſo long as they lie within the reach of air, which is their life and ſpirit.

Indeed, if we make a fallow in a very dry ſummer, and plow deep and often, we may be ſaid to have a tolerable clean crop the year following; but in the ſecond and third crops, and ſo on, we ſhall find the weeds and graſs daily gathering ſtrength again; ſo that it is evident, the fallow year did not infallibly deſtroy them, it only ſickened or retarded their growth for a ſmall time.

Docks, thiſtles, nettles, ſcutch-graſs, or by ſome called quicks, and many other roots, will grow though you turn them a thouſand times over with the plow, or any other implement; yet they may be not only effectually deſtroyed, but converted to a friendly and uſeful manure, or food for other plants by trench-plowing: therefore let us turn our eyes on this valuable method, and trace out, by ſound reaſon, where their deſtruction is practicable, and the many good effects ariſing therefrom.

The word trenching is commonly made uſe of by gardeners, when they dig a piece of ground two or three ſpade grafts deep, in performing of which, they firſt make a hole as deep as they propoſe to dig, then they pare off the upper ſod ſo deep as it contains any graſs or weed-roots, or any ſort of rubbiſh, and throw it to the bottom of the ſaid hole or trench, together with any ſtraw or long dung, which they want to convert into rotten manure, as ſuch are not proper for a top-dreſſing.

This done, they cover it with the ſecond and third ſpade graft, ſo that the bottom of the ground, to the depth of two or three feet, now becomes the top; this is called by the gardeners trenching, though it is not practiſed ſo often as it ought; but every ſenſible experienced gardener will follow this method, as by it, he kills two birds with one ſtone, as it were, for he not only throws the ſod or rubbiſh out of his way, from being obſtructive or troubleſome to him in ſowing his crops, but it is a kind of dunghill or hotbed under them.

Scutch-graſs, weeds, or other rubbiſh being out of their growing latitude, and for want of air, putrefy and ferment, and every fermentation cauſes a friction, which naturally bring on a heat, in proportion to the ſize of the body that actuates it.

As for inſtance, the heat of a hotbed is in proportion to the quantity of dung put together in a heap, which, if large, the heat is great alſo, and which is ſenſibly felt by putting a hand therein, and the ſtrength of the heat abates as the ſize of ſuch bodies grow leſs, till it cannot be diſcerned by the touch of the hand.

Though reaſon tells us there is a degree of heat in every body that putrefies or ferments, be it ever ſo ſmall, even till it comes to a ſingle ſtraw or fibre of a graſs root.

In ſhort, many good effects may derive from this method of covering, or burying the upper ſod, with a proper quantity of the under ſtratum, or maiden mold.

Firſt, this ſod, be the ground ever ſo poor, is interwoven with various ſorts of roots, either of graſs or weeds, both of which are very obnoxious and deſtructive to any crop we can ſow therein, for they not only feed upon what ſhould nouriſh the profitable plants, but they take up the ground that ſuch plants ſhould ſtand upon, and alſo hinders the free circulation of air, ſo that if not eradicated, will entirely poſſeſs themſelves of the ground: and we ſee that the beſt fallows, or deep plowing, is not capable of making a total deſtruction of ſuch enemies; at the beſt it is only half doing the work, for they ſoon recover and re-eſtabliſh themſelves, to the no ſmall mortification of the tiller.

But by covering the ſaid ſod, thus interwoven with graſs, weeds, &c. with a body of mold, we not only get quit of them as enemies, but are at the ſame time converting them into a kind of hot-bed, dunghill, and fallow.

In ſhort, by being thus buried, they act in all theſe capacities, for being covered only by ſeven or eight inches of earth, they cannot vegetate through ſuch a body; it incloſes them from the air, and nothing can grow without it; therefore, what juices they contain, immediately begins to ſweat, ferment, and putrefy, all which cauſes a friction, or working of the different ſpirits together, ſome part of which fumegates or evaporates through the body of mold by a ſteam or ſmoak, (if we may compare great things to ſmall) in the nature of a dunghill, or hay-ſtack, when newly put together, and in the ſtate of fermenta-

tion,

tion, our eyes and feeling can witneſs for the latter, and ſo may our reaſon for the former. Therefore, while it is in a ſtate of fermentation, it acts in ſome degree as a hotbed, which nouriſhes and enriches the earth and plants about it. when the ſtate of fermentation is over, it then acts as a manure, and food for plants, whoſe fibres will naturally ſtrike down to feed thereon; and what is yet farther in its favour, it may juſtly be called a fallow in reſerve, and a dunghill without labour or expence, and this not only for a year or two, but will hold good for ever, becauſe the ſod that is trench-plowed under, this year, will be effectually rotten and mellow, ready for turning up the next, and when it is turned up, you turn down another weedy ſod, or furrow in its place, and thus go on alternately, turning up a dead rich mellow mold, and down in its place a tired, weedy, or a graſſy ſod.

Be aſſured, that when this practice is thoroughly adopted, no manure or fallow need ever be applied, as none can be ſo good as ſuch a dreſſing.

Nevertheleſs we do not exclude marling, claying, or ſanding, theſe are generally put on to change the ſtaple or nature of the ground, and may be as uſeful in this, as any other ſort of tillage, but ſhall refer our readers to the chapters that treat on theſe articles; and it may not be amiſs, before we quit this ſubject, to clear up a doubt which may ariſe, in regard to killing all ſorts of weeds by burying them; for, ſays he, quicks or ſcutch-graſs, docks, nettles, thiſtles, and ſuch ſort of roots, will grow or ſtrike downwards, perhaps two feet or more, therefore how can they be buried or killed with plowing a dozen or ſixteen inches only?

However, we are to conſider that theſe, no more than every other vegetable, can live or vegetate, without a ſufficient quantity of air, and though a tap-rooted plant may ſtrike downwards ever ſo far under ground, yet air is conveyed to every part thereof, by the tubes, veins, or leaders, taking it in by the external part of the plant, and which ſerves not only as mouths to take in nouriſhment, but as air-pipes to convey it to every part of the root, in order to keep vegetation alive.

But on the other hand, if ſix or eight inches of the top of any ſort of plant be taken off within the ground, and the remainder of the root covered with ſo many inches of mold, it will effectually ſmother and ſtop it from growing, as a few inches of earth over the crown of a plant, of any kind, will ſtop the circulation of air, therefore cauſe a deſtruction of the root.

It is with the vegetable as with the animal creation, for neither can ſubſiſt without air; a land animal will live when put into water, provided the mouth or noſtrils be above the ſurface, but if theſe be covered with water only an inch, then the creature drowns, becauſe this body of water keeps out the air from circulating to other parts of the body of the animal.

Thus it is with weeds or plants of any ſort, for if any part of a plant come to the ſurface of the earth, it takes in air to keep the whole body thereof alive, whereas if the whole be covered, ſo as to exclude air from any part thereof, that plant muſt immediately die and turn to corruption.

All the difference between a land animal drowning with a ſmall body of water over it, and a plant requiring a larger body of earth is, becauſe water being a ſmooth glaſſy ſurface, a thin ſheet will exclude air from entering therein; but earth when under tillage breaks into lumps or clods, and is ſometimes intermixed with ſtones, conſequently keeps the mold looſe and open, which admits air through it.

Therefore, if the plants be not covered with ſix or eight inches of mold, they may be ſupplied with air through ſome of theſe cavities, and the rougher the ground is, the greater chance they have to meet with this ſupply; for the finer the ground, the cloſer it falls; and to help to conſolidate it the more, it may not be amiſs to run land that is trench-plowed over with a heavy roller; by ſuch precautions there is not the leaſt doubt but that you may ſmother every ſort of weeds with ſix or eight inches of mold over them.

On a journey to Scotland, and in an open town field, near the city of Glaſgow, we found a great many labourers at work, trenching ground, ſome two ſpades deep and a ſhovelling, for which they are paid from forty ſhillings to three pounds an acre, according to the depth they go; we ſaw plainly that the ſucceſs in their crops, by this method were not doubtful, for as their land had been trenched two or three years before, the earth they threw up from the bottom of the trench, was as black and rich as garden mold.

As this work was performing in an open town field, there were ridges that belonged to farmers who never trenched their land, upon trying theſe ridges, at two or three ſpade grafts deep, we found the under ſtratum a red hungry ſand; therefore it was evident, that by trenching, the nature of the ſoil had been changed, and when the crops began to appear, it was eaſy to point out every trenched ridge in the field, by their aſpect, being better corn, and clearer of weeds.

An experiment partly of the ſame nature was tried by a gentleman in one of our ſugar iſlands, but now lives near the city of York; though the diſtance is great, and the climates in thoſe iſlands, much hotter than England, yet the nature of the land is nearly the ſame.

The land on which this experiment was tried, and where the ſugar-cane grows, is ſand, the underſtratum is a hard binding gravel.

The gentleman who tried the experiment, ſaid that it is ſometimes cuſtomary, after they reap the firſt crop of cane, to let the land lie unmoleſted or uncultivated, and it will bring a ſecond crop, which is inferior to the firſt, yet as it is attended with leſs expence, anſwers ſometimes very well.

A plantation containing ſix acres of cane was reaped, and the land was let lie for a ſecond crop, but obſerving that it promiſed to be bad, the ſaid land was trenched to a good depth, the upper ſtratum was buried, and in its place turned up a hard ſtrong gravel, ſo that the land had more the appearance of a gravel walk than that of a ſtaple for any thing to grow in.

This being a thing quite out of the common method, the eyes of the planters were upon it, and the opinion of every one was, that the land was ſpoiled; ſome would have it that it would never grow any thing more, others, that it would produce a plentiful crop of thiſtles.

In ſhort, the ſix acres were planted with ſugar cane, and contrary to all their expectations, produced a wonderful crop, which were two hogſheads and a half of ſugar each acre,

beſides

beſides the offals, which more than pays all the expence.

This ſhews that trenching ground in any climate or land is profitable.

In Mr. Young's ſix-months tour, is noted an experiment tried in trench-plowing by a very worthy gentleman, near Crakehill, Yorkſhire, which ſeems to corroborate with all the experiments that has been tried or met with, and we cannot do greater honour to Mr. Young, than to give it to our readers in his own words, which are theſe following:

The capital improvement effected in tillage, conſiſts in trench-plowing. In the year 1765, was plowed eleven acres of land, the rent of which was ſeven pounds; it was firſt cut by a paring wheel plow, worked by three horſes, and then came a ſtrong wheel plow, drawn by two oxen and ſix horſes, by which means a depth of ten inches was gained, and the eleven acres was finiſhed in eighteen days; a man followed the plow, to tread down the ſods, ſix out of the eleven acres were ſown with barley, and produced as in the following table:

	l.	s.	d.
Six acres produced twenty-one quarters three buſhels of barley, ſold for	28	7	0
Three acres and a half were ſown with turnips, and ſold for - -	14	6	1
They were fed off with ſheep, and kept thirty-nine for 18 weeks			
Another acre of turnips was ſold for -	4	0	0
Beſides theſe articles, the field produced five buſhels of tares - -	1	0	0
Two buſhels and a half of white peaſe - -	0	10	0

Thirty buſhels common potatoes - -	3	0	0
Nine ditto early, at 3s. per	1	7	0
Which is per acre -	4	15	5
	52	10	1

This crop is upon the whole very conſiderable; the land was before ſuppoſed to be very bad, and the rent was trifling; beſides, this ſpecies of improvement has been generally ſuppoſed to operate very little at firſt, the ſourneſs of the under ſtratum of the ſoil requiring ſome time to be ſweetened and meliorated by the influence of the atmoſphere, ſo that ſuch product of the firſt crop muſt be thought a very great one.

	l.	s.	d.
In 1766, four acres of this field were ſown with barley, and produced 19 quarters, the price not minuted, let us calculate as before, 27s. per	25	13	0
Six acres and a half yielded turnips, ſold at -	16	10	0
Fifty buſhels of potatoes, at 2s. 6d - -	6	5	0
Which is per acre -	4	8	0
	48	8	0

In 1767, the field was cropped with maſlin and barley, four acres of the firſt, produced ninety-two buſhels, ſold at 4s. 6d per - -	20	6	0
Six acres of barley produced twenty-nine quarters and five buſhels, at 23s.	34	1	2
One acre not ſowed.			
Which is per acre -	5	8	8
	54	7	2

This experiment, which is particularly valuable, proves in the ſtrongeſt manner, the excellency of the practice. If the reſult of three years' experience, does not ſatisfy the moſt cautious cultivators, I know not what will. Our author ſtill goes on, and ſays, In 1766, the ſaid gentleman trench-plowed in the ſame manner as before, another field of five acres, and harrowed in oats on one part of it, and beans on the reſt; the crop was, viz.

	l.	s.	d.
One hundred ſixty-ſeven buſhels of oats, at 2s. 6d. - -	20	17	6
Twenty-eight buſhels of beans, at 3s. 6d. per	5	5	0
Which is per acre -	5	5	10
	26	9	6

We cannot help taking notice, that both the tryer and compiler of theſe experiments, ſeem to have no idea of the grand point, namely, that of again turning up the ſod when the roots, &c. were all rotten and turned to manure, which would certainly be the caſe, by the time the firſt crop was reaped. It appears that the ſucceſs in crops was all produced from a maiden earth, without any aſſiſtance from manure; but if the whole ſurface had been turned up, when reſted or rotten, by an interior fallow year, the proprietor would have found it enriched beyond expectation, and might have promiſed himſelf, if poſſible, a double return, and it might have been worked with two horſes in a plow, as the land would be light and mellow, after the firſt breaking up.

We have had ſeveral experiments tried on different ſorts of land, and every one proves beyond a doubt, that of all the improvements, none is equal to trench-plowing.

A TABLE

Of the Expence and Profit of an Acre of Trench-plowed Wheat.

	l.	s.	d.
To the rent of land, being graſs, and plowed at Michaelmas - -	0	16	0
Tythe for the ſaid acre	0	5	0
Plowing - -	0	12	0
Seed - - -	0	7	9
Sowing, harrowing, and rolling - -	0	2	6
No weeding, as there was not a ſingle weed to be ſeen.			
Reaping and drawing into the barn - -	0	9	0
Total expence	2	12	0

To 41 buſhels 3 pecks of wheat, at 5s. 3d. per buſhel	10	19	2¼
Clear profit from this acre	8	7	2¼
The ſtraw pays for threſhing.			

CHAP. VIII.

How to fix the Plow for Trench-Plowing.

IN the foregoing chapters we have endeavoured to quote circumſtances, and to enforce reaſons, in order to prove the utility of this valuable method of trench-plowing; in this chapter we come to the application of the work.

Though ſeveral learned authors have admitted both of the value and probability of trench-plowing, yet we do not remember one, who has entered heartily upon the cauſe, or has pointed out a method how the farmer could perform the work with any reaſonable degree of expence.

Mr. Randal indeed went ſo far as to invent trench-plows, and advertiſed them at ten pounds a ſet, but this was both too high in price, and too perplexed or complicated in working, ever to gain a footing among the common farmers, therefore the ſcheme, though laudable and praiſeworthy, fell to the ground almoſt at its birth.

But notwithſtanding Mr. Randal's ſcheme failed, we do not in the leaſt deſpair of ſeeing this valuable method of trench-plowing become general among the farmers, particularly as they may perform the work in an eaſy cheap manner by the common plow, with little alterations; for not any thing deters them more from putting any ſcheme in execution, than a ſhew of expence.

When we have fixed upon the ground to be trench-plowed, our next ſtep is to try the depth or ſtaple of the ſoil with a ſpade, and from this we can judge what depth we would have it plowed, and fix the plow and irons accordingly.

If the land be good and deep, the weeds, and graſs runs deep alſo, conſequently the upper ſtratum, or what compiles the ſod, is thick; in this caſe the firſt plow muſt be fixed ſo as to run quite under all the roots, by which the next furrow, when turned, will be all freſh mold, or what is called maiden earth.

This being turned over the firſt furrow, which now lies at the bottom of the trench, is what the corn is to grow in the enſuing year, therefore muſt be a proper depth or thickneſs for that purpoſe.

If the land have a tolerable good bottom, you cannot go too deep, but if it be a very tough, hungry clay, or a poor red or white ſand, in either of theſe caſes, it may be prudent not to go ſo deep the firſt year, as clay will be worſe to break into ſmall particles; but whether clay or ſand, it may be too deep for the roots of the plant to penetrate through, in order to feed in the under ſtratum, and which they will ſtand in need of, in ſuch poor ſoil.

Therefore, in ſuch land go a moderate depth the firſt, and add a little more the next trenching, for an enſuing crop.

Any common plow without altering, will turn the firſt furrow, and all that is wanted in the next, is to add to the mold-board a caſt-off board, in order to raiſe the ſecond furrow over the firſt, and which is fixed after this manner, viz.

The firſt thing you are to obſerve, is to have the wing of your ſhare ſo broad as will cut your furrow clear the breadth you intend it; ſuppoſe it be ten inches broad, the ſhare muſt be alſo ten inches, meaſuring from the point of the wing to the land ſide, in this caſe the wing will be about five inches. You muſt have . thin plate of iron, about two inches and a half broad, welled acroſs the upper ſide of the wing of the ſocket, ſtretching from the breaſt of the plow to the point of the wing.

About half an inch of one edge only is to be welled, the remaining two inches is to remain open, in the nature of a flat ſocket, to admit a thin end of the turn off board therein.

The ſaid turn-off board muſt be about four inches broad, and ſo long as will reach from the wing of the ſocket to the brich of the plow ; it muſt be about two inches thick, and muſt have a bracket at the under ſide, in the nature of a foot of a fender, which bracket muſt bear upon the mold-board of the plow, in order to ſtrengthen the caſt-off board, that it may bear the weight of the ſod when it riſes.

There muſt run horizontally

through this board, a ſmall iron bolt ; one end muſt be crooked like a T, this is to go into a long nick, made in the breaſt of the plow ; when in, it muſt turn half round, that it may hold faſt therein, by which means it will bind faſt the turn-off board to the mold board.

Without any other help than this bolt, the bracket under, and one end being made thin to go into the ſocket, that is, in the wing of the ſhare, it will be ſufficiently ſtrong.

As many inches thick as you have turned the firſt ſod, ſo many inches the hind part of this board muſt be raiſed from the ſole of the plow, meaſuring at the brich, ſo that the ſod (as ſoon as it parts from the wing of the ſhare) riſes gradually till it comes to the brich of the plow, then it turns fairly off, and it falls upon the firſt furrow.

This is all the addition or alteration that is wanted, for performing this great and valuable piece of work of trench-plowing; it is ſo ſimple and eaſy, that no doubt but any common plowman may fix it, and the whole expence cannot be above one ſhilling.

The plough known by the name of the Yorkſhire or Rotheram plough, invented by Mr. Varlo, is the moſt proper to perform this work.

CHAP. IX.

Shewing the proper Seaſons for Trench-plowing, together with a few philoſophical Reaſons relating to the Salts in the Air.

HAVING been very explicit in the foregoing chapters, in ſhewing the utility of trench-plowing, and where it operates or takes effect for the good of the crop, there only now remains to point out proper ſeaſons for performing the buſineſs in, with two or three philoſophical remarks thereon.

The farmers common notion of ſummer fallows are, that what good they receive is, by being in a ſtate of reſt for one year, and by turning up the roots of graſs, weeds, or ſuch like obnoxious plants to the ſun, in order to be killed by the heat, when expoſed thereto.

They have no notion of the atmoſpheres diſcharging the oils, ſalts, or manures it contains upon their furrows, ſuch thoughts may be too ſublime for their underſtanding.

We do not deny but their intellects may be as ſtrong as thoſe of other men, but we refer to any ſenſible reader, if their ideas in general are not much confined; which is very ſurpriſing, when we conſider that their daily buſineſs lies more among the works of nature, than that of any other ſet of men whatever; conſequently muſt afford more matter for philoſophy, which brightens the mind, and opens the ideas to a refined underſtanding.

A better reaſon cannot be given

for a farmer's want of penetration into the works of nature, than a familiarity of his being always among them, by which his wonder ceaſes, his curioſity is ſatisfied, and his enquiry at an end.

The returning ſeaſons put him in mind to ſow, and ſo does the crop when ripe to reap; his eyes convince him of the beginning and ending thereof, and therewith he is ſatisfied, without penetrating farther into the wonderful cauſe thereof.

Experience tells him, that a great quantity of dung forces him a good crop of corn, and is not wanting alſo to raiſe him a plentiful one of weeds.

This he ſees, but ſince labour and expence will eradicate them, he troubles his head no further about it; when his land is tired of corn, and overſtocked with weeds, his next ingenuity is to reſt it, and kill his weeds by a ſummer fallow.

This courſe of huſbandry chiefly takes in all his curioſity or enquiry into the works of nature.

The proper ſeaſon to begin trench-plowing is about Michaelmas, for the following reaſons; Firſt, becauſe by that time we reap the profit of the preſent year crop. If ſtubble land be the object for trench-plowing, let it be done as ſoon as the corn is got off, in order to bury the ſtubble, graſs, or weeds, whilſt they retain their juicy particles, which will add much towards rotting, fermenting, and enriching the earth; and ſince this method of burying them, anſwers a better purpoſe than the ſummer fallow for killing them, we have no occaſion to loſe a year's profit, and much labour in plowing on that account.

Secondly, we may ſow any crop we pleaſe, ſuppoſe wheat after wheat, it matters, not ſince what mold produces the laſt crop is buried, and turned up in its place a freſh maiden earth, that muſt be the chief ſupport of the preſent trenched crop.

Thirdly, if the under-ſtratum be turned up in the latter end of the year, it will be ſubdued, brought to temperance, and enriched by the winter's ſnow, froſt, and atmoſphere, which, let the farmers think what they will to the contrary, contributes more towards enriching their land than the ſummer's fallow; and would they come rightly into this way of thinking, they would not let their land lie in a cloſe dormant ſtate all winter, but plow it and leave it open, in order to receive theſe benefits; but it may not be amiſs in this place to give a few philoſophical reaſons, how the air becomes impregnated with ſalts, and how they aſcend and deſcend to enrich the earth, &c.

As no proof is ſo convincing as

occular demonſtration, we ſhall refer our reader to a ſimple experiment, which he may try by an onion, viz.

In the middle of the winter, when onions are in their moſt dry and light ſtate, weigh one very exactly, then tye a thread round it, and hang it up at the top of a room, where no part thereof can touch the wood or any other matter.

As ſoon as ſpring puts in, it will begin to grow or vegetate into a long top; when it is in its moſt vigorous and juicy ſtate, before it begins to weather, weigh it again, and you ſhall find its weight augmented ſurpriſingly, perhaps one third.

It is quite clear to the weakeſt underſtanding, that what it increaſed in weight was collected from the atmoſphere, as it had no connection with any other matter that could afford this addition.

Now ſince it is obvious that the atmoſphere or air is impregnated with oils, ſalts, or ſulphurs, which act as manure or food to the vegetable creation, our next problem is, how it came there, and this we can trace from various cauſes.

But nothing is better known and more clear to every farmer, than that ſoot is a good manure, and alſo that it is a collected ſubſtance from various bodies, ſuch as coals, ſticks, ſtraw, turf, earth, water, candles, oil for lamps, the ſteam of boiling pots, &c. All theſe, or as many as are burned in a room, evaporate and ariſe up the chimney, which is purpoſely contrived as a paſſage for the air, and which attracts and takes with it all evaporated matter; and though we find great quantities of thoſe cling or adhere to the ſides of the chimney as ſoot, yet both our eyes and reaſon tell us, that much greater quantities eſcape, and riſe into the firmament.

Beſides all theſe bodies uſually

conſumed in houſes, which are very great, there are alſo other ſorts which ariſe from natural cauſes, ſuch as the ſteam and ſmoke of dund-hills, hay-ſtacks, or any ſuch matter, when in the ſtate of fermentation; likewiſe the burning of lime, bricks, and burn-beating. In ſhort, all the animal creation aſſiſt in ſending manures into the clouds, both by avacuation and ſteam from their noſtrils, &c.

It is true, ſome things produce more ſalts, and richer vapours than others; as for inſtance, ſuppoſe we lay together two or three hundred weight of coals, and throw upon them five or ſix gallons of water, ſet the coals on fire, and they, together with the water, ſhall all aſcend in ſmoke, except a few pounds only of aſhes.

At the ſame time, if you burn in the ſame room ever ſo many candles. they ſhall all evaporate imperceptibly, mix with the ſmoke, from the aforeſaid coals and water, and all unite and join in the natural cauſe of compoſing three of the elements, namely, air, water, and earth.

All this is plain to the eyes and reaſon of any man; but how theſe bodies ſhould be divided or ſeparated, and again deſcend as manure, &c. is another queſtion, and perhaps not within the comprehenſion of every one.

From all the foregoing remarks and obſervations, we ſee the immenſe bodies of matter that evaporate and ariſe into the ſky. All the clouds we ſee floating about in the firmament, are compoſed of earth, water, and air, ſometimes the fourth element, fire, intrudes therein, which cauſes a convulſion, from which proceeds thunder and lightning, as fire and water cannot agree together.

The water is exhaled, drawn up or attracted by the heat of the ſun, at different periods; the earth is divided into very fine particles, and mixed therewith, ſo that theſe two bodies being incorporated, are borne up in ſmoke by the air and exhaled by the ſun, ſo keep aſcending till they come at a pure, fine, thin, ſerene air.

Being arrived in this latitude, the heat of the ſun, together with the thinneſs of the air, rarifies and divides the ſalts, oils, and earth from the water, for the air in this region is ſo thin and fine that it is impoſſible for any groſs matter ro remain therein, without undergoing a rarifaction, that cauſes a ſeparation of particles.

The two bodies or elements of water and earth being thus divided, deſcend again to our earth, one in clear rain water, and the other imperceptibly in ſnow, miſts, fogs, duſt, &c.

Every farmer will admit that ſnow is a great enricher of land, which may be accounted for in this manner, viz.

When large bodies of water and

earth aſcend into the upper rigions, and when in the act of rarifaction there comes a cold eaſterly wind, which cauſes a great emotion, agitation, or tumultuous friction in the firmament, by which the waters are toſſed, tumbled, and chaffed to ſuch a degree, that they are raiſed into a white froth, and whilſt in this frothy ſtate, the extreme coldneſs of the air congeals and binds the earthy particles up with the water, ſo that both deſcend, as ſnow upon the earth, and when melted or diſſolved, the water returns to the drains, but the earth or ſalts remain on the ground, and acts an manure, which we may ſee immediately take place.

For after every ſnow we may diſcover the earth (particularly plowed land) very light, open and ſpungy, which is very plain, that ſome oils, ſalts, or ſulphurs, had penetrated therein and cauſed a fermentation, or we ſhould diſcover no more alteration in the mold after ſnow, than after a heavy ſhower of rain, which makes it generally remain ſad and cloſe.

A great deal of theſe enriching qualities alſo deſcend in the time of froſts, which penetrates, works, lightens, and enriches the earth, which upon the froſt going away is eaſily diſcovered.

We have gone through theſe allegations, in order to prove the value of winter fallow, or opening the ground to receive all theſe benefits.

Therefore point out the latter end of October as the beſt time for beginning to trench-plow.

For as we turn up a dead inactive earth, the ſnow and froſts, (as before obſerved,) will not only ſubdue and temper it, (if hard and ſtubborn,) but alſo raiſe it into a lively fermentative action, and cauſe it to become friendly and mellow.

All the aforeſaid reaſons prove beyond a contradiction, both the large quantity of manures the air contains, and alſo how it aſcends and deſcends to enrich the corn-mold; but however, notwithſtanding all this, the under-ſtratum of ſome grounds will be ſo barren, that a top-dreſſing of ſome fine manure, ſuch as lime, aſhes, pigeon-dung, malt-duſt, or a compound of manures, may be adviſeable to throw on with the firſt crop.

But if the farmer's ſituation be ſuch, that he cannot provide himſelf with any ſuch manure, his next forecaſt muſt be, to ſow ſuch crops as will do beſt without manure, and at the ſame time ſhould they miſs, he may have no great loſs therein, as for inſtance.

Should the land be ever ſo poor, and whether clay or ſand, if it be trench-plowed in autumn, it will grow vetches for a winter crop, and be the earth ever ſo dead or inactive aforetime, if any one thing begins to grow therein, it naturally brings on a lively fermentation, and when the crop is off, the roots become a manure; vetches is an excellent crop for ſuch trenched land, for ſeveral reaſons, parlicularly if eat on the ground with ſheep or ſmall cattle.

Firſt, becauſe the expence of the ſeed is but a trifle.

Secondly, what fodder it produces is in a manner elear gains, as they do not take the year's rent upon them, being ſown after the crops are reaped, and may be eat off the ground time enough to ſow ſpring-corn thereon.

Thirdly, by the trampling, urine, and dung of the cattle, the time they are eating the vetches on the ground, the land will be much improved thereby, ſo that it will be in condition for any crop the enſuing year.

A farmer ſeeing all theſe advantages, and comparing them with his own ſituation, and ſtate or ſtaple of his ground, may apply ſuch dreſſings, or ſow ſuch crops, as in all appearance, will afford him the moſt profit, and alſo bring his land into the beſt condition for the future, with the leaſt expence.

If the land be trench-plowed in the latter end of the year, and not ſown with any crop till ſpring, it may not be amiſs to give it a thin plowing juſt before ſowing with great care, though not to touch or turn up any part of the under ſod.

Then ſow the ſeed you intend, and harrow it in, which having no ſod to tear in pieces, it will be eaſily wrought, and fear not but you will reap more profit from this method of trench-plowing, than any other whatever.

CHAP. X.

The Author's Opinion on Smutty-Wheat; from what it proceeds, and its Cure.

SMUT is a black ſubſtance, incloſed by a tough ſkin, when broke falls to powder; and though many authors have warmly and learnedly handled this ſubject, yet we humbly conceive they have dropped ſhort of the real cauſe from whence this misfortune proceeds.

We have turned over moſt authors on this ſubject, and find ſeveral have ſtumbled on part of a cure, though none have hit upon the right cauſe.

The ſtrength of every argument is known by the reaſons quoted therein; neither can any argument be good or well grounded, that will not bear ſifting or trying to the bottom.

In order to open the ideas of our readers as much as poſſible, we ſhall give a few quotations, as follows:

In 1764, a paragraph appeared in the Dublin Journal, of a farmer in Cheſhire that ſowed a field with wheat, one half of which was marled, and the other dunged; the dunged part was ſmutty, but that which was marled, was not. The ſaid paragraph alſo deſired an anſwer from any one who could ſolve this myſterious point, but was not anſwered.

In the ſummer of 1769, a piece of wheat belonging to one Mr. Clarke, a farmer, near Bungey, in Suffolk, which contained about ſeven acres, four of which were the ſmuttieſt ever ſeen; upon an average, it was computed that the third part was ſmutty, but the remaining three acres were very clear of ſmut.

This was a curioſity which brought many people to ſee it, and ſtaggered many who pretended to be connoiſſeurs in this myſterious point.

Clarke ſaid he pickled the ſeed all alike in ſalt and water, ſtrong enough to ſwim an egg, and limed it till he brought it to a conſiſtence proper for ſowing, and ſowed it all within the ſpace of three days, which proved dry weather; the field likewiſe was ſummer fallowed, and all got plowing alike.

He was told that he threw the diſeaſe into the ground by his manure.

Upon my word, anſwered Clarke, that may be the caſe, for I dunged the ſmutty part, but the other I manured with a black mud or ſludge I raiſed

I raiſed out of the bottom of a pond and other ditches.

This immediately correſponded with all concurring circumſtances.

Upon this, we went to look at the wheat, and by pulling up many roots of the ſmutty corn, found innumera- worm-holes in them; but as the weather was very hot, and the ground dry and ſandy, the worms had retired deeper into the ground for moiſture, therefore could not come at them, having no ſpade in the field.

The above is a convincing proof, that the diſeaſe came into the ground by the way of the dung, as both the land, ſeeds, and management, were all alike.

It was alſo evident that the pickle of ſalt and water (though ſtrong enough to bear an egg, in which the ſeed was ſteeped a winter's night) had not afficacy enough to prevent the vermin brought in by the dung, from preying upon the roots of the corn.

Clarke laid the dung on when in the ſtate of fermentation, ſmoaking hot out of the foldyard, at which period the flies or inſects were in their greateſt vigor, and their eggs moſt likely to come to perfection.

This alſo ſhews the great miſtake in farmers not laying their dung in heaps, and giving it time to ferment, rot, and cool, before they lay it on the land, that theſe vermin may be ſmothered in their infancy, and not taken out in the dung, to prey upon the fruits of their labour.

Some authors aſſert, that ſmut proceeds from the ground being wet, but the above accident quite deſtroys ſuch an argument, as this was remarkably dry ſandy ground.

A ſimilar caſe happened to the editor, who ſowed a field with wheat, which was bought at a diſtance; it was pickled with ſalt and water ſtrong enough to bear an egg.

The field was manured in different parts, viz. with horſe-dung, lime, ſoot, coal-aſhes, and pigeon-dung.

The cōnſequence was, that the wheat as far as the dung reached was ſmutty, the reſt of the field was quite clear. This naturally led to find out the reaſon thereof; and in examining the dunged part, by pulling up the ſtubble, &c. we found the ground particularly full of grubs or worms of ſeveral ſhapes and ſorts; which no doubt were the offspring of the uſual inhabitants of dunghills, ſuch as flies or inſects of diverſe ſorts, which drop their eggs therein, and by the heat, fermentation, and putrefaction of the dung, theſe vermin are brought to life and miſchief.

The niceſt obſervations we can make, and concurring circumſtances herein quoted, leave no room to doubt, but ſmut proceeds from a worm or grub; and if it be not the red or cut worm, it is of that nature; we have taken a ſmall grub of that likeneſs out of a root of ſmutty wheat, and have very often found ruſty cankered traces of worms in the roots of corn.

About the laſt of May and beginning of June, wheat is ſhooting into ear; and the ear is no ſooner out of the ſtem or ſtraw, but the ſkin of the grain is formed and filled with a ſoft, pulpy, milky ſubſtance.

At this criſis, the worm or grub ſeizes upon the root of the plant, and feeds upon the fine particles or juices thereof, which ought to aſcend to nouriſh or feed the grain. And though ſo ſmall a worm may not take in all the juices belonging to an ear of wheat, yet, by making an orifice to feed out of, it wounds the plant and gives vent to the ſap, ſo that it bleeds (as it were) itſelf to death.

A root of corn, by branching or ſtooling, may produce thirty or forty ſtalks or ears, and each ear takes in its nouriſhment from the main root, by a vein or leader purpoſely placed to feed through.

If the worm or grub ſhould ſeize, upon the ſaid vein, and feed upon what ſhould ſupply nature, doubtleſs the milky ſubſtance already incloſed in the ſkin, would dry up, and become a black powder, or dead ſubſtance, for want of farther nouriſhment; in ſhort, it is very poſſible for one grain in the middle of an ear to be ſmutty, and the reſt not hurt; as doubtleſs each grain has a vein leading from the root peculiar to itſelf, through which it takes in its nouriſhment; but we believe it impoſſible to account for this in any other way than by a worm or ſome ſuch inſect ſeizing the vein peculiar or belonging to each grain.

There are three ſtages or periods, in which corn may be ſpoiled by theſe vermin, viz.

Firſt, when they prey upon it, after it is in the ear, but before the grain is formed. When it is catched in this ſtate, chaff falls off, and leaves ſtanding a naked ſtalk; this we have ſeen often happen even in all ſorts of grain.

Secondly, (as before obſerved) when the ſkin or bran-part of the grain is formed, and tough enough to hold the ſoft milky ſubſtance, but before it is formed into a ſolid body, then the vein is wounded, and nature ſtopped from fulfilling her office; therefore, what was already in the ſkin, for want of farther ſupply, dries, and becomes a black, light and lifeleſs powder, much like lamp-black; but as the ſkin or bran is tough, it is confined therein, in the form of a ball; and when it comes under the flail, it is burſt and let at liberty, like duſt among the corn, and hangs at the downy end thereof, ſo that when it comes to be ground, the flour and bread is made black and diſagreeable to the eye, but indeed not to the taſte, as the palate cannot preceive any diſagreeable taſte it has: and, if the wheat could be threſhed or got out without burſting theſe balls, it would not be of much ill conſequence, as the balls are ſo light, that they might be eaſily ſeparated from the heavy corn by ſeveral methods.

Therefore it is beſt for a farmer who is troubled with this malady, not to threſh, but laſh ſuch corn. and winnow the ſeed, with as little mixture or treading on as poſſible.

Another good method is, to leaze or pick the ſmut out before it is threſhed, but it muſt be a nice diſcerning eye that does this, as ſome ears of ſmut are much like the good corn;

and

and if one ear or two be left in a ſheaf, it will ſpoil the colour of the bread.

The third ſtage in which wheat is ſeized, or obſtructed in its feeding or filling, is when the grain is about half ripe; then the worm ſeizes it, and being deprived of farther nouriſhment, it dries and ſhrivels up to a ſmall weeſened flinty grain, and though it is ſmall, yet, by its firm texture, one might expect it to produce a little meal; but upon inſpection it is found to be almoſt as hard as a flint, and of no uſe. This is called by ſome of the Engliſh farmers, flints; and by others, trucks.

The above conſiderations are more than a probability, that a worm is the cauſe of ſmut; yet we hope what is to follow will make it appear much ſtronger in its favour; we ſay hope, becauſe, if we are acquainted with the diſeaſe, the cure is more certain.

It is allowed by moſt writers on this ſubject, that pickling wheat will prevent ſmut: this we readily admit, but however believe, that ſome pickles commonly made uſe of will ſcarcely prevent it; and as firmly believe ſome others to be effectual.

But give us leave to aſk ſuch authors, how they propoſe theſe pickles to operate? Do theſe authors, who believes that ſmut comes by a blaſt, imagine, that pickle could prevent the wind from having any power over the plant? And was it not both a very partial pickle and wind, that would prevent all the Cheſhire and Norfolk farmers fields from being ſmutty, as well as that part which was marled; likewiſe the editors, as above ſtated, and ſeveral others which have had the like trials, and met with the like impartial winds?

Again, doe ſuch authors, who place the reaſon of ſmut to the account of not changing the ſeed, believe, that if the pickle had power to prevent the ſeed, bought three or four miles off, from being ſmutty, that it ſhould not have the ſame power over ſeed grown in his own land? Or do they really think, that it is any more poſſible for ſmut to grow and taint any other corn than lamp-black; ſeeing it is as utterly diveſted of every vegetating quality?

We have ſown very ſmutty wheat, variouſly prepared, both with and without pickling, but never ſaw that it was attended with any bad conſequences ariſing from ſmut: and if the ſeed were good, otherwiſe we ſhould never be deterred from ſowing it, as it is clear to us ſmut is not the occaſion of ſmut, it being as poſſible for a bit of dry powder, out of a rotten ſtick, to grow, or taint others, as ſmut.

Often has a ſubject ſtarted amongſt a club of farmers, who perhaps would be of as many opinions as there were people in the company, one aſſerting that ſteeping in ſalt water would prevent ſmut, another that it would not, a third vouches ſmut to grow ſmut, a fourth that it will not, and ſo on.

But now again, if we turn our eyes on the worms, we ſhall find it as clear as the noon day, where the pickles operate to prevent them from feeding upon or wounding the plant as above; we ſhall alſo find, that the more nauſeous or poiſonous the pickle is made, the more likely it is to be effectual in its purpoſe.

Wheat being put into a tub of pickle, the ſkin or bran is the firſt that imbibes the liquor, and the thick glutinous part thereof ſticks, clings, or gathers to the ſkin; and when the lime comes to be added, it incloſes, coats, or candies the grain, by which there remains a kind of cruſt, which retains its nauſeous quality for a long time.

Now we are to conſider, that the ſkin or bran never grows or leaves the ground, but remains encircled with the root, which grows and ſpreads round it; this is a plan truth, which may be immediately proved by pulling up a root of ſtubble, and upon examination it will be found, that the huſk is quite uniform, and nearly reſembling a blown egg, having a hole at each end, one to let out the root, and the other the top; and though the grain be buried deep, yet in a general way it will riſe to, or near the ſurface, and generally ſtands perpendicular.

The inſide or floury part of the wheat, being all fled, changed, or grown into root and branch, we might expect, that as the bran is left a dead lifeleſs body, it would putrefy, rot and fall to duſt; but, on the contrary, it will (if the ſtubble be not trod or moleſted) preſerve its perfect ſhape for ſome time after the corn is reaped.

This is eaſily accounted for, as it is the pickle which preſerves it, and the ſtronger the pickle, the longer it will maintain its ſtrength, both of ſmell, taſte, and texture; which ſtinking quality is ſuſceptible to theſe delicate, deminutive creatures, whoſe ſenſe of ſmell is the main guide they are poſſeſſed of, to conduct them to their food; and we apprehend it would be impoſſible for one of theſe worms to live in, and feed upon a root of wheat, that contains this ſtinking pickled bran or huſk.

If a farmer do not dung his land, but enrich it by often plowing, as hinted in ſeveral parts of this work, it is a very great chance if he will have a grain of ſmut in his wheat.

This is alſo eaſily accounted for, and makes good our aſſertion of being the cauſe thereof, as another reaſon may help to evince, as follows.

A farmer had a field that was always ſubject to ſmut; the land was examined, found it had been much dunged, was very rich, and crouded with many ſorts of worms.

At that time indeed we were not acquainted with the pickle that would prevent it; and he had uſed the ſalt and water pickles to little purpoſe.

We therefore adviſed him to plow his field every month in the year, both winter and ſummer, when under fallow, which he did, and ſoon cleared it of vermin. The crows and birds of all ſorts, followed the plow, and picked up every inſect they could find.

The plow coming ſo often in a place diſturbs and breaks up their neſts or dens, ſo that they are prevented from breeding, and the old ones being expoſed to the fowls of the air, their race is ſoon extinct.

It is well known to moſt farmers that red worms are moſt predominate in freſh or new land, (that is) ſuch as has lain a long time in graſs, which has given time for theſe inhabitants of the earth to breed; but upon the ground being turned, and the graſs which uſed to be their food being deſtroyed, and corn ſubſtituted in its place, they feed greedily upon it, and deſtroy many a good crop of corn.

Upon old going land they are ſeldom found, or at leaſt, ſo thin as not to do much miſchief. And how can this be accounted for otherwiſe than that, as long as the land lieth in graſs, the worms can breed and feed unmoleſted; but when diſturbed, they meet with the above conſequences of being deſtroyed by the feathered creation.

This again ſhews the value of tillage, and how aſſiduous and active every one ought to be to promote it.

CHAP. XI.

On planting, in general, Foreſt-Trees of all Sorts.

THE improver is to conſider planting in two different lights, one for pleaſure, and the other for profit; but if he have a taſte and judgment, he may join them both together, and fetch profit out of pleaſure.

The pleaſure coſiſts in judiciouſly tranſplanting a mixture of various ſorts of trees, ſo as to make a diverſity of ſhapes, ſuch as ſerpentine walks, clumps, groves, hedge-rows, &c. ſome to come early into bloſſom or leaf, and others late; ſome of one colour, and ſome of another.

When a wood, grove, or hedgerow, is thus variegated with objects differing in colour and ſhape, it gives delight to the eye, and pleaſure to the mind, but doubly ſo to thoſe who have a contemplative turn to muſe upon the works of nature. What can be more delightful, or even heavenly, than for a perſon of buſineſs to retire from the cares of the buſy world, a few hours, into a well-planted grove? There every object he ſees invites him to contemplate upon the works of his Creator.

The feathered creation alſo are warbling out their various notes, in their Maker's praiſe, and telling man (the favourite work of God) that they were all created for his pleaſure. A poet might well in raptures break out as in the following lines:

My God I love, and I adore!
But ſouls that know would love thee more,
Whilſt I on earth do hide, and ſtand
Behind the curtain of thy hand;

Thy hand unſeen ſuſtains the poles,
On which this huge creation rolls!
The ſtarry arch proclaims thy power,
Thy pencil glows in every flower;
In thouſand ſhapes and colours riſe
Thy painted wonders to our eyes;
While beaſts and birds, with lab'ring throats,
Teach us a God in thouſand notes.
The meaneſt pin in nature's frame,
Marks out ſome letter of thy name.
Where ſenſe can reach, or fancy rove,
From hill to hill, from field to grove,
Acroſs the waves, around the ſky,
There's not a ſpot, that's deep or high,
Where our Creator has not trod,
And left the footſteps of a God.

If a planter wiſh for both profit and pleaſure, he muſt plant a mixture of ſeveral ſorts of trees, and place them in ſuch a manner, that they neither intercept his view, nor take up his ground (ſo as to prevent its producing its ordinary courſe of crops) and that, at the ſame time, they be agreeable objects, to attract the eye, and enrich his pocket.

The fancy of man in plantations,

(as in moſt other things) has changed much, within theſe few years laſt paſt.

The taſte was, formerly, to plant all in long cloſe rows, at each ſide of an avenue, or in hedge-rows, or in woods; but the method is now, to plant in round, ſquare, or angular clumps, in different parts of a domain, at a diſtance from the manſion-houſe; and alſo to plant odd trees in a ſcattered manner, up and down lawns and meadows, near the houſe; ſo as not to obſtruct any proſpect, and yet to make the place look warm and ſheltered.

This taſte is extremely agreeable to the eye, and alſo profitable, becauſe the trees are augmenting in ſize, by feeding under-ground; and, at the ſame time, the ſurface is producing any crop the owner pleaſes, particularly if he makes choice of ſuch trees as feed deepeſt in the earth.

In this caſe we would have him guard moſt againſt aſh; it being a tree which, though very uſeful and profitable, yet is a great impoveriſher of the corn-mold, as it feeds near the ſurface of the earth ; neither is it a tree for beauty ; as it comes the lateſt into leaf or ſeaſon, and goes the ſooneſt out. It ſhould be planted by the ſides of high-roads, commons, or ſuch-like waſte grounds.

The oak is the beſt tree that can be planted in a lawn, meadow, or plowed ground ; becauſe it feeds deep, and therefore does not impoveriſh the ſurface ; and, if in ground that is under tillage, the plow can (without obſtruction) go near the trunk.

The ſmall-leafed elm is an excellent timber, alſo a quick grower, and a profitable tree ; it ought to be planted in hedge-rows ; as it will bear planting cloſer together than any other tree. It has an aſpiring head, and grows beſt when the boughs are lopped off near the trunk; in this caſe, it does little damage to any underwood that may be under it.

The following is a liſt of trees that are proper to be planted intermixedly in lawns, meadows, or pleaſure-grounds, viz. oak, Engliſh elm, beech, Scotch fir, ſpruce fir, ſilver fir, New-England pine, horſe-cheſnuts, walnut, poplar, ſycamore, larches, black-cherry, apple, and white thorn-tree.

Theſe, being properly mixed, will give a diverſity of colours and ſhapes, very agreeable to the ſpectator, and every one be uſeful in their turn.

In order to imitate nature, as near as poſſible, they ſhould be placed very irregular, and likewiſe ſo thin, as not to obſtruct any proſpect, except ſuch as are diſagreeable, as a rock, a barren bit of land, or a marl-pit, a quarry, or the like; all ſuch as theſe ſhould have a clump planted before them, to hide them from the eye.

As to all diſtant monuments, valleyes, woods, rivers, fiſh-ponds, towns, churches, caſtles, antique buildings, &c. theſe are agreeable objects, and ought not to be obſtructed from the eye by any home-plantation.

As to the method and time of planting, it varies much; ſome will recommend Michaelmas-planting for foreſt-trees, and others the ſpring.

Trees planted in either ſeaſon, may do well; but we find by experience, that the beſt time is, when the ſap is riſing, viz. from the beginning of March to the end of May.

The month of May is as good a time as any in the year, to plant evergreens in, ſuch as fir, larch, &c. In ſhort, elm trees, and ſome others, thirty feet high, removed at Midſummer, will thrive well.

The beſt way of planting them is, not to dig a hole, as is uſual, but to ſet them upon the top of the ground, and dig a grip round each tree, at about three feet diſtance; and with the earth that comes out, you muſt cover up the roots; which will form a little bank or hill round the tree-root; but before you ſet the tree upon the ſurface, you muſt turn the ſod (it is to ſtand on) the graſs-ſide downwards; then the roots will ſtand upon the freſh mold.

This is not only an eaſy method, but alſo a very good one; becauſe the roots feed among the corn-mold; and when the ſod rots it turns to manure about the roots, and encourages the growth greatly. If the land be ever ſo poor in nature, yet they will flouriſh amain.

Being planted, the next care is to fence them from cattle; for if they be either cropped, or rubbed againſt, that retards their growth, and makes them runtiſh. In ſhort, a man had better never plant, if he does not fence from cattle.

But as the expence and trouble of fencing diſcourages many a one from planting, we ſhall point out an eaſy cheap method, to keep the cattle from the trees.

When trees are planted in open paſtures, the uſual method is, to ſet three ſtakes round the tree, in a triangular form, and nail three ſticks on the tops of them, and then faſten thorns therein.

The beſt method is, to tie two bunches of whins (or thorns) round the trunk of the tree, with a thumb-rope made of hay or ſtraw; after which, daub a little cow-dung over each rope; which will prevent them from eating it.

This is a very cheap ſimple method, and anſwers the end better than poſt or rails ſet round, particularly for all trees that are ſix feet high and upwards; and, indeed none of a leſs ſize ought to be tranſplanted out of the nurſery, particularly into lawns, meadows, and ſuch-like open places, where cattle comes. In fencing the trees thus, take care not to put on over-much whins or thorns; five or ſix pounds weight, if properly placed, with the prickly ends outwards, will anſwer the end as well as ever ſo much.

When moſt ſorts of foreſt-trees are planted, the ſide-branches ought to be lopped off; but the tap-branch, which is called the leader, muſt be carefully preſerved from any hurt; for, when this is gone, the tree is not worth much. If wind, froſt, or any accident, wound or break a leader of a tree, it is the beſt way immediately to root it up, and replace it with another; as the expence of a tree is a trifle, in compariſon of loſing two or three years growth, and the beauty of the tree alſo.

As to ſoil proper for trees, we need ſay little about; as few people in theſe days but what know that very well; particularly ſuch as riſe nurſeries, either for their own uſe, or for public ſale.

As to the wetneſs of the ſoil, this is immediately provided againſt by the method of ſetting the tree upon the ſurface, and making a grip round it; this puts low wet ground nearly upon the balance of that which is of a drier nature; and whoever tries it, will immediately find the good effects thereof.

CHAP. XII.

How to make a NURSERY, *&c.*

AS we would be as conciſe as poſſible, without being thought tedious in relating things which are generally known, we ſhall therefore, in a few words ſhew the beſt method of raiſing a nurſery of foreſt-trees, from ſuch ſeeds as may eaſily be procured in the country, by any country-gentleman or farmer.

When you have fixed on the ground for a nurſery, as this is ſeldom of a large extent, we would, by all means, adviſe trenching it with ſpades, at leaſt two ſpits deep; burying the upper ſpit (wherein are all the roots of graſs, weeds, &c.) at the bottom; this will prevent much of that trouble, that generally attends keeping nurſeries clear from weeds, graſs, and ſuch-like real enemies to young plants.

The ground being thus trenched, and levelled with a harrow or a garden-rake, your next ſtep is, to determine upon as many ſorts of ſeeds as you would ſow, and make ſo many diviſions out, by either ſtakes, or bits of boughs.

After this, ſow your ſeeds, as intended, upon each diviſion; then lay out each diviſion in beds nine feet broad, and ſtretch a garden-line at each ſide, to guide you ſtraight; make a ſmall furrow, about a foot broad, and half a foot deep; and with the mold that comes thereout ſpread over the ridge, to cover the ſeed, which will be about one inch thick, and which is a ſufficient covering for any ſort of ſeed.

By this method (which is performed with little trouble, being nothing but a ſhovelling of looſe mold to ſpread over the bed) you ſave a great deal of ſeed, to what you would do by harrowing or raking in; becauſe, in this caſe, all the ſeed is covered at an equal depth, and ſo will come up more even altogether; and none of it lies expoſed to the fowls of the air; but, if harrowed, the pins let ſome in very deep, whilſt others lie above ground, for birds to carry off.

A very little ground, for a ſeed-bed, will raiſe a great number of plants; but at two, or at moſt three years old, the plants ſhould be pricked out into another nurſery, prepared by trenching, as the ſeed-beds were. If ſet in rows, eighteen inches aſunder between each row, and one foot in the row diſtant from each other, they will ſtand very well, to be eight or ten feet high, before they need to be tranſplanted out for good and all. They grow up ſtraighter, and have cleaner trunks, for being cloſe together in the ſecond nurſery.

CHAP. XIII.

Explaining the Author's new-invented moving Sheep-Houſes, &c.

WE have often lamented the miſerable condition in which we have ſeen both ſheep and cattle, when eating turnips on the ground in a wet ſeaſon; particularly if the land was inclined to clay, or of ſuch a nature as to hold water.

How extremely diſagreeable muſt it be for the poor dumb animals to ſtand or lie in dirt, perhaps ſhoe-top deep, which is too often the caſe.

It is impoſſible cattle in ſuch a ſituation can thrive, or feed ſo well, as were they to lie dry, clean, and warm, neither can they eat the turnips with that freedom and appetite, when they are rolling or tumbling about in the dirt, as they would out of a clean rack or manger, not to ſpeak of the loſs and waſte in turnips when in ſuch a dirty condition.

This we believe will be aſſented to by every reaſonable man, and this alone is enough to retard the culture of this valuable crop from ſpreading or becoming ſo general as one could wiſh.

Every one ſees the neceſſity of ſome contrivance to remedy theſe evils, but no one ever yet ſtruck out a plauſible plan; ſome farmers indeed would carry the turnip crop off and eat it upon graſs ground, but this is attended with great labour and expence, beſides cutting and ſpoiling the ground, and as the ſaying is, robbing Peter to pay Paul, as it certainly hurts the turnip ground to carry the crop off.

It was ſuch material conſiderations as theſe, which firſt put us upon the ſtudy if poſſible to find out a remedy for ſuch evils, and we flatter ourſelves that we have accompliſhed our deſign, by the invention of a moveable houſe, which not only anſwers all the ends of keeping the cattle dry and clean, and of ſaving the turnips, &c. but is alſo of a ſimple conſtruction, and comes cheap to the purchaſer, which are very material conſiderations in any new invention; for the higher the price, and the more complicated the machine is, the lower is its value or utility to the public.

Theſe are the grand points which every inventor ought to keep in view, for though the invention be ever ſo ingenious, if the conſtruction be ſuch, that none or few but the inventor can work it, or ſo high in price that the purchaſe will overbalance the utility ariſing therefrom, it cannot be ſaid to be profitable: this is the rock that many new inventions ſplit upon.

The top of the houſe is flat, as it is found by experience that tar will laſt the longer on, for if it have a fall, in hot weather it would drain off and leave the boards dry; in fact, it would be better to have an inch of water always ſtanding on them, which will preſerve the tar for any length of time; therefore, it is beſt to nail a long lath round the edge of the houſe to keep the water on, and if there be a body of tar under it, even no thicker than a ſhilling, it will preſerve the paper and boards under, neither will it let the water through in any reaſonable time.

The ſheep-houſe is ſixteen feet and half one way, by ſix the other; it is all made of deal, has no floor in it, has a rack and manger, the rack is filled with turnips, &c. at the outſide of the houſe.

The leaves that the ſheep eat

through, ſtand plum, ſo conſequently, the ſlope which gives room for the turnips, projects to the out-ſide of the houſe.

Under the rack is a manger fixed, which goes cloſe to the bottom, and and only conſiſts of one deal board, ſix inches broad, one thick, and ſixteen feet long, as it goes all the breadth of the houſe; one of the edges is ſloped, or made feather-edged, ſo as to nail to the bottom of the rack, by this it forms a ſort of triangular trough, going narrow at the bottom.

The rack being filled with turnips, any that are large, ſtick in the top thereof, and as the ſheep eat them they grow ſmaller, ſo conſequently drop lower and lower, till they are ſmall enough to drop through the ſtaves into the manger, which catches every bit, ſo that none need to be waſted.

The rack-ſtaves are three feet

long, and are fixed into the two rails, one for the top, and the other for the bottom of the rack, in order to ſave a multiplicity of timber. And in order to cut it to the beſt advantage, buy one plank ſixteen feet long by three inches thick, and twelve broad.

This will cut into four ſcantlings, each about three inches ſquare; theſe are all that are wanted for the frame of the two ends of the houſe.

It is to be obſerved the houſe is ten feet broader than it is long.

Two of theſe ſcantlings are for the fore part of the houſe, and the other two for the hind part.

The rack and manger are fixed in the end of the houſe that goes foremoſt; one of the rails or ſcantlings are tenoned into a ſtandard at each end, and which, both ſerves for a platform, the bottom of the rack, and a ſide or back part of the manger, becauſe the rack ſtaves go into it.

They are three feet long, and are fixed into the other rail, which is the top of the rack, and alſo tenoned at each end three feet high into the ſame ſtandards that the bottom rail is tenoned.

The ſcantlings for the ſide of the houſe are three inches ſquare, and ſix feet long; there is only one at each ſide for a platform, and which are tenoned into each end of the ſixteen feet and half rails, which go acroſs the houſe.

The poſts or upright ſtandards, which are to ſupport the roof, and to which the boards are nailed round the ſides of the houſe, are only two inches ſquare, and four feet long.

There are five tenoned into the platform, or ſixteen feet and a half ſcantling at the hind part of the houſe one at each corner, and three at equal diſtances between.

Between theſe, are three more, of three feet long, each tenoned at equal diſtances, into the topmoſt rail of the rack.

Theſe ten ſtandards, being five before and five behind, are oppoſite each other, and they muſt ſupport the roof of the houſe.

Five ſpars are joined by mortiſe and tenon to the top of the ſaid ſtandards, each ſpar is ſix feet long, to go the length of the houſe, and on which, the covering boards are nailed.

At each ſide of the houſe are three ſtandards to nail the ſide boards on, or put netting through, but we think netting round the houſe is beſt, except the front, where the manger is; ſo that the whole number of ſtandards round the houſe are ſixteen, the number of ſcantlings or rails ſix, and the number of ſpars five, which being all joined together as above, form the ſkeleton of the houſe, and what remains is to incloſe it with thin boards at three to an inch, or netting as above.

The covering boards muſt only be nailed in the middle of the board; this will give them liberty to dry in or expand themſelves when whet or dry, without cracking or opening with the ſun or wind, whereas, if they were nailed with more nails than one in the breadth of the board, the nails would not give way or yield to the change of weather, therefore there muſt inevitably be an opening between each nail.

In order to prevent the boards from riſing or blowing off with the wind, you muſt cut a twelve feet inch deal into five rods, almoſt like tyling laths; you muſt ſtretch one of theſe acroſs the boards oppoſite to each ſpar, and thereto nail them with twelve-penny nails, obſerving only to put one nail in the middle of each board cloſe by the firſt nail that faſtens the board on.

Theſe laths keep the boards firm and cloſe, and at the ſame time give them liberty to play and expand themſelves backwards and forwards, and yield to the weather as it requires, by which means the boards will never crack or open.

The houſe runs upon four caſtors, like thoſe of a bed.

Two of the caſtors are fixed under the frame at the two hind corners, and the other two are fixed as far diſtant from them under each of the ſides towards the rack, as the rackfull of turnips will weigh it down, ſo that by once trying what weight of turnips it takes to bring down the ſaid end, for the future you have only to fill the rack till the end come down, and by a piece of chalk, ſet each rackfull down on the houſeſide; by this you can eaſily tell what weight the ſheep eat from a day to a month, and ſo on.

Likewiſe what weight each acre will produce.

A little trouble and conſideration will ſhew you at what diſtance from the rack to fix the balancing caſtors, as they are to act in the nature of a center in a ſcale beam, and the longeſt end of the houſe from theſe caſtors is to be equivalent to the weight of turnips put into the rack.

It is neceſſary to have the ſaid two caſtors that act as a center for the balance a little higher than the two hindmoſt caſtors, in order to make the forepart of the houſe cock up about ſix inches from the ground.

The houſe always ſtands upon two deal boards, and having two moveable deals, in order to lay before or at the end of theſe two, you draw the houſe forward upon them, ſo by bringing the hindmoſt forward, you may eaſily move the houſes any where, for by going behind to puſh it on, the ſheep will naturally fly from you, therefore be no hindrance; and as the caſtors always run upon the boards, they are ſo light a draught that a boy may move them with eaſe.

By having the moveable boards ſixteen feet and a half long, every time they are ſhifted you meaſure a ſquare perch of ground, and as there are an hundred and ſixty perch in an acre, and as each houſe will hold twenty ſheep, you may bring yourſelf to a regular mathematical rule to know how much weight of turnips each perch produces, and how long they will ſerve ſuch a number of ſheep.

And all is done without any more trouble than making a chalk every time you move the houſe, and another chalk each time you fill the rack.

The rack end of the houſe always

goes forwards towards the ſtanding turnips.

You pull the turnips as far as you can reach, and fill the rack, then puſh forward the houſe to a freſh piece; as you pull up the turnips with one hand, you muſt in the other have a whiſp of ſtiff wheat ſtraw, cut in the nature of a bruſh, to take off any dirt that may be on the under ſide of the turnip; this is almoſt as eaſily done as let alone, as it keeps the manger clear from dirt.

The labour of taking the turnips by the top, and throwing them into the rack, (having it always beſide you) is no more than the preſent cuſtom of hacking up the ſhells.

It is to be obſerved, that ſheep are not the better for being kept over cloſe, therefore net work is better than boards to incloſe the houſe round the ſides where the manger is not.

No door to let the ſheep in is wanted;

ted; inſtead of which, lift up the hind part of the houſe and prop it with ſticks eight feet long, and the ſheep will go under, and when in, let it down.

The boards which cover the houſe muſt be covered with three ſheets of thick ſtrong brown paper; they muſt be dipped in warm tar, and laid on one above another, croſſing the joinings, and over all, pour on tar till it is about the thickneſs of a ſhilling.

The above is as conciſe a deſcription as we can give to make a ſheep-houſe, and there is nothing differs from that of an ox-houſe, except the height thereof, and the ſize of the timber.

CHAP. XIV.

Shewing the great utility of the Moving Sheep Houſes, were they brongbt into general uſe, for all ſorts of cattle.

WAS our reader to conſider the immenſe quantities of manure he loſes by the preſent method of houſing the cattle, he would let nothing prevent him from making uſe of moving-houſes.

In Germany the farmers make more uſe of liquid, than any other manure, which experience and their crops tell them that they are right.

They do not loſe the leaſt urine from the cattle while they are in the houſe.

They alſo convert little houſe dung into liquid manure, and bring it in caſks many miles; they buy it by the gallon at a very high price, and put it together in a pit or reſervoir, and keep it ready for uſe, and eſteem it the better for age; they alſo take care to have cloſe covers to theſe liquid pits, to prevent the ſun from exhaling the ſpirits therefrom.

Reaſon proves beyond a contradiction that they are right in all this, and if ſo, our Engliſh farmers would do well to copy from them, and to pay due regard to ſuch manure.

Moſt ſorts of cattle, ſuch as horſes, hogs, cows, or ſheep, evacuate much more weight by urine than by dung, and the ſame weight of urine will produce much the greateſt quantity of ſalts, which are, what muſt feed the crops.

When turnips are eat on the ground with ſheep in the moving houſes, the land gets all an equal dreſſing, as the ſheep are confined juſt as long on each part as they are in conſuming the crop that grew thereon.

But when at liberty, they, upon every cold blaſt or ſhower of rain, run together under a hedge or any little ſhelter they can find, and remain there till they over manure it, though other parts may want.

Perhaps ſome of our readers may not conſider the thing right, and may imagine that twenty ſheep being confined on one perch of ground, may tread it to dirt.

But this is not the caſe, becauſe they are no longer confined than whilſt they eat the turnips that grew thereon, and this they muſt do, be they confined in what other fencing you pleaſe, only with this difference, that they will make more feetings by running backwards and forwards to take a bite out of each turnip, than they would do by eating them out of a clean rack and manger.

But what makes dirt in the common way of eating them is, when a freſh break is opened, the ſheep immediately traverſe it all over, and trample it full of holes, which the firſt ſhower of rain fills with water; therefore when the ſheep goes again over it, the ground is made immediately into mortar, ſo conſequently the ſheep are retarded from feeding, and a great part of the turnips waſted, by being trod and tumbled about in the dirt.

But in the houſes this is all prevented, as not the leaſt rain falls upon the ground after the ſheep comes on it till they leave it again.

And the ground being whole or untrod when they come upon it, they cannot tread it to dirt, for the more they tread, the dryer and firmer it will be.

They only lie one night on the ſame ground, neither do they ſtand half ſo thick on the ground as they do in the common method of folding.

The turnips being pulled and thrown into the rack, the ſheep eats them while they are green, freſh, and retain all their juices; but in the common method, ſuppoſe the ground be dry and ſandy, yet the ſhells become dry and loſe a great deal of their ſubſtance.

Any farmer who contrives to make the beſt of his crop, will eat the turnip tops with lean ſheep, either ewes or hogrils, becauſe they are not of ſo feeding a nature as the bottoms, being full of a ſharp acid quality, which ſcowers fat ſheep, and retards their feeding.

Some farmers in Lincolnſhire buy old ewes, and draw out their foreteeth, and turn them among their turnips to eat the tops, without ever touching the botoms.

This method, though a barbarous one, ſhews œconomy, and leaves profit if properly managed.

But ſuppoſe the ſtock be too large for the tops to feed them, there may be a loſs attending it, as they can eat nothing elſe to finiſh the fattening.

Now all this is provided againſt in the houſes, becauſe every ſecond or third houſe may be allotted for lean ſheep, and the tops cut off and given to them.

This may be done with little trouble, by having a ſcythe point, or the like, faſtened in the corner of every houſe, and a baſket placed under it, for the tops to drop into when cut off; and as the houſes are all of a row, and cloſe together, they have only a few ſtrides to carry the tops and throw them into the rack to the lean ſheep.

A few turnips may be given now and then to the lean ſheep for change of diet.

The ſame œconomy may be uſed in regard to horned cattle fed with turnips, for the tops may be given to cows, calves, or any ſort of lean cattle, and the bottoms to fat cattle, with the like ſucceſs as in ſheep.

If horned cattle be put into houſes made the ſame way, but ſtronger and higher in proportion to the cattle, they muſt be tyed to the bottom of the rack by a halter that goes round their horns.

Any cattle or ſheep that are fed upon turnips ſhould have a little hay put into the rack every day; in order to clean their mouths, and give them a freſh appetite for turnips.

We ſee the many and great advantages that attend theſe houſes, in point of turnips; but their utility does not end here; it extends alſo to graſs ground.

They are very uſeful for field-ſtables, or ox-houſes; it being much better to have a moveable ſtable, that can be ſhifted at pleaſure, to a clean and poor part of the field, than, as is uſual, to have them ſtand always in a place whereto the cattle reſort, and not only break the ſurface, and tread the ground to mortar, but with their urine enriches it more than needs, whilſt other parts want it.

Dung, indeed, may be gathered up, and ſpread elſewhere; but urine when waſtefully dropped cannot be recovered.

We hope to ſee the time in England, that due regard will be paid to the liquid manure, and that farmers will have no other but moving houſes or ſtables, to expend all their winter fodder in.

Was this the caſe, they might manure double the quantity of ground with the ſame number of cattle, and alſo keep more cattle with the ſame quantity of fodder too, as none will be waſted, neither need they any litter or bedding, for being moved twice a day, viz. every night and morning on a clean freſh piece of graſs, they would lie very clean and dry.

What a great piece of graſs ground might a farmer manure in a winter, with ten or a dozen of theſe houſes, going on a breaſt up a field.

But was this ever to be the caſe, care muſt be taken not to ſpread the dung on the places where the cattle ſtalled: as that would be rich enough without it.

Each houſe will manure well, without any other aſſiſtance than what went through the body of the cattle, two acres in the winter half-year.

Such houſes as are made for winter uſe, may be converted into hog-houſes in ſummer; and are very valuable to any one who keeps hogs to feed on clover, or any other ſour graſs; becauſe the hogs can be confined on a place till they eat it bare, and then ſhifted on to freſh.

By the clover not being trod or

tumbled on, it will go the farther; and tho' the hogs are ſafely confined, (being a miſchievious creature) yet they will thrive well.

Beſides, there is no one who has cattle in ſummer paſtures, but what has many rank places therein, which produce long ſour graſs, that the cattle will not eat, and which is the moſt proper for hogs; therefore if a parcel of hogs be put into one of theſe houſes and the houſe run over ſuch places, by that means you convert what before was of no uſe, into real profit.

So that, in ſhort, tho' theſe houſes are cheap and ſimple, yet their utility may be immenſe, if brought into general practice.

As carrots and cabbage are excellent winter-feeding, and are likely to gain footing in the world, by ingenious and ſpirited cultivators, theſe houſes may alſo be of infinite ſervice in feeding cattle on the ground therewith; as in the caſe of turnips.

CHAP. XV.

On the Management of TURNIPS, *and their perfection.*

TURNIPS are a crop that deſerves the huſbandman's attention, perhaps as much, if not more than any one he can cultivate, particularly for winter-feeding for cattle.

Their general uſe, as food for cattle, is not of very old ſtanding in England; tho' much more ſo than cabbage or carrots; but in fact, every vegetable of the ſort has made a quick advance within the ſpace of a few years.

If we look back we ſhall find that not longer than two centuries ago, we had no greens or roots for the table, but what were imported from the Netherlands.

The people in thoſe days imagined the climate of England would not produce garden-ſtuff; but were they to ariſe again, and take a view now, they would be ſurprized at the progreſs we have made therein; as perhaps we may now go near to rival the world in that point; tho' yet far ſhort of being at the height of improvement, as new diſcoveries are making every day.

The county of Norfolk is more forward in turnip-huſbandry than any other part of England; it is their capital piece of farming, in which they take great pains, and certainly do excel.

Their land is very proper for the crop, being chiefly inclined to ſand; therefore the cattle are not abuſed, nor the turnips waſted in dirt, by feeding off; which is one of the firſt conſiderations belonging to a turnip-crop.

We have ſeen both clay and loam produce heavier crops of turnips than in Norfolk, and with leſs labour too; but then the queſtion was, How to eat them off? This is the rock they ſplit upon, as one half perhaps was waſted in the dirt; neither do the cattle thrive ſo well, or feed ſo faſt in ſuch a diſagreeable dirty ſituation. It is that, which deters farmers from entering heartily into the ſpirit of the crop; and not ſo much the want of knowledge how to raiſe it.

That being ſimple and eaſy; as turnips are far from being a tender plant.

But we hope the moving houſes will put an end to theſe difficulties, and that farmers will cultivate this valuable crop on every ſort of land, and every part of the kingdom, as there are none but what will produce them, if properly managed.

In 1748, was raiſed in Ireland, upon ſtrong clay-land, thirty acres of turnips, that upon an average, weighed thirty-nine tons per acre; but ſome of the beſt part of the field was weighed, and proved to produce fifty-three tons per acre.

But the land was ſo clayey and wet, that no cattle could go on it, to eat them; ſo that they were obliged to carry them off in hampers, on horſe-back, which made it very expenſive and troubleſome, not being then acquainted with the moving ſheep-houſe.

The Norfolk farmers raiſe all their turnips after fallow; they give three, four, and ſometimes five plowings.

They generally dung for turnips; therefore by the fallow, well-dunging, and two or three hand-hoeings, they may well expect a good crop; yet they often loſe them by the fly, and ſometimes have their land to ſow two or three times over.

The beſt farmers will begin to hoe when the turnips are very young, perhaps not above an inch high.

In this they are certainly right; becauſe if they be ſuffered to grow thick at firſt, they draw one another up tall and weak; in which caſe they get a bad turn in appling; but if thinned early, the tops ſpread along the ground, and they apple more kindly.

For their firſt hoeing, their general price is three ſhillings per acre, and the ſecond two ſhillings per acre.

When they ſell a crop, their medium price is about forty-five ſhillings per acre; which is but low. But this is chiefly owing to plenty, as every one is in the branch.

Their weight of turnips, per acre from thirty to 40 tons.

The crops vary leſs in quality than in any other part of the kingdom, owing chiefly to their courſe of huſbandry,

bandry, as every one follows it without varying. And indeed it muſt be confeſſed, the Norfolk people are the beſt turnip-farmers in England, to take them in general.

But the labour of hand-hoeing comes cheaper to them than in any other part of England; owing to the labourers being much accuſtomed thereto.

A man will hoe half an acre in a day, the ſecond hoeing, with eaſe; which is a trifling expence, in compariſon of what it coſts in other parts of the kingdom, where people are entire ſtrangers to that branch.

If land be inclined to weeds, hoeing is abſolutely neceſſary; as it anſwers the end in a three-fold capacity, viz.

In deſtroying the weeds, and improving both the land and turnips; and they are great ſlovens that neglect it, and deſerve to be pointed out and laughed at by every one.

There is no land but what will throw up weeds, except trenched land; and though this may do better than any other without hoeing, yet the labour here alſo would not be thrown away.

The improvement which the land would receive, by ſtirring and opening the mold, to let the ſalts of the air there among, and by thinning the turnips, to encourage their growth, would more than doubly pay the expence.

As far as we have tried trenched ground with turnips, (and one may tell by a little matter what would be the caſe in a great one) it is far preferable to any other tillage; owing to the ſtaple of the ground being deep.

The manure that lies at the bottom thereof encourages the tap-roots to ſtrike downwards, and feed thereamong

Though the body of the turnip

lies above ground, yet it is chiefly fed by the tap-root, which runs perpendicular, to a conſiderable depth; and the beſt turnips have generally only one root; and that long and ſmall, with only a few ſmall fibres branching therefrom.

The next obſervation is, that any tap-rooted plant, (ſuch as carrots, parſnips, or turnips) ſtrikes deeper, and has a better root in the ground that is pretty cloſe and firm, than when the land is too light and open.

In ſuch, they grow forky, having many roots; which is productive of a very bad top.

Every ſenſible gardener will tread ſuch light ground, when the ſeeds are ſown, to prevent the ſaid evil.

This alſo ſhews, that it is alike neceſſary for a farmer to roll his turnips or carrots, as ſoon as ſown, if the land be light, particularly on trenched-ground; as that will be more open and light than land that is only plowed one furrow deep.

It is an agreed point, that land for turnips ſhould be well tilled; ad that the cleaner it is from weeds, he better.

It is the farmer's intereſt to ſow ſuch land with turnips, as is tired with corn; becauſe it undergoes ſeveral operations to improve it.

If ſtubble-land, it ſhould be plowed as ſoon as the crop is off, and be well fallowed all winter, and till ſowing time, which is about Midſummer following.

But thoſe who chuſe to follow the new method of trench-plowing, will ſave much labour, and be much ſurer of a crop.

The beſt method is, to ſow part of the crop, on, or as near the twenty-fourth of June as poſſible, and another part about three weeks or a month after, and when it is likely for rain, and in an evening.

By dividing your ſowings thus, the crop has not only two chances, but comes in at proper periods, for ſheep to be turned therein, to eat it to the beſt advantage.

The firſt ſown will be ready to turn in about Martinmas; and the laſt ſown may be kept for ſpring feeding.

If you follow the old huſbandry, the quantity of ſeed per acre is one pound; and, in ſowing, take up what ſtays between one finger and thumb, and chuſe a calm evening to ſow it in.

Some will cover the ſeed by buſh-harrowing; but it is beſt to roll it in as ſoon as ſown.

Tho' no manure comes amiſs for turnips; yet we never ſaw better crops than from aſhes after burn-beating.

They are fond of aſhes in general, but particularly of thoſe burnt from the ſod.

However, we do not approve the method; except it be a wild, coarſe, deep, ruſhy, or heathy land.

But where the land has a fine ſod, it is bad policy to burn it; becauſe a great deal of the ſubſtance of the land flies into the clouds; and let men argue as they will againſt it, we know both from reaſon and experience, that it hurts land for the future.

It is a moſt vile cuſtom, to burn ſuch kindly, fine graſs-land, as is burnt in ſome parts of England; certainly no man would do it, were he to conſult reaſon, and look two or three years before him, and ſee what would be the conſequence.

It is true, he may be ſure of a crop by this method; and ſo might he by a good fallow, which would improve rather than hurt the ground.

If the ſod or graſs-roots be reduced to manure in the ground, either by fallow or trench-plowing, in ſuch a caſe it leaves a laſting ſubſtance therein.

But in moſt ſorts of land, when burned, nine-tenths of the ſubſtance ariſe into the firmament; for lay a ton of ſods together, and, when burned, they ſhall be reduced to two hundred weight of aſhes.

Let not any man deceive himſelf, by believing that all the manure ſtays in the aſhes; for that it does not.

There are ſeveral ſorts of enriching qualities in the earth; but for brevity-ſake, we ſhall only mention two, viz.

Acid ſalts, and oily ſalts; the former are of a more ponderous nature than the latter; therefore, while the fire is reducing, or rather ſeparating the groſſer particles of the earth from theſe manures, ſome of the heavieſt ſalts remain among the aſhes.

But the oily ſalts, which in fact are the richeſt and ſmootheſt food for plants, evaporate with the ſmoke.

We may know this by ſoot; for one buſhel, taken from a chimney, will go as far, for manure, as twenty buſhels of aſhes taken from the earth; and yet they are both rarified, or divided from the ſame fire, and from the ſame groſs materials.

Therefore, let us only conceive what a miſtake farmers lie under, who raiſe manure by fire.

In ſhort, every combuſtible matter is very full of oily ſalts; it is thoſe that make it burn; and all ſuch matters leave very little ſubſtance behind them; they aſcend into the firmament, and are aſſiſting to compoſe the clouds that we ſee floating over our heads.

The turnips being ſown, the next conſideration is, the proper time for hoeing them.

In this, as in moſt other things, people differ in opinion; ſome will hoe them when very young; ſome when half-grown, perhaps; and others condemn that practice altogether, and will not hoe at all.

He that hoes them when young, has the advantage of all the reſt, becauſe the tops being ſmall, the work is more quickly and ſafely performed; for, when the leaves are large, and hang over, or cover the ground, it takes up a great deal more time, to look out and divide the beſt plants; and as they are hid with leaves, except great care be taken, the hoe may reach to, cut, or wound plants one would wiſh to preſerve.

He that will not hoe at all, is ſtill worſe, for then he not only lets the turnips ſmother one another, if ſown thick, but permits weeds to grow, to aſſiſt in deſtroying his crop, and alſo robs his land from a hoeing, which would be of great uſe to it, let the crop be as it will.

CHAP. XVI.

On different Sorts of Turnip-Seed.

THE following is a liſt of various ſorts of turnip-ſeed, that are chiefly in cultivation at this preſent time in England.

Firſt, the large Norfolk ſheep-turnip. It ſtands the winter well, and grows to a good ſize; the apple or body of the turnip grows all above ground, and has a large top.

Secondly, the early red-top turnip. This alſo grows large, but does not produce ſo much weight upon an acre as the firſt ſort; which is owing to its flat ſhape.

It has a ſmall top, which is of a

darkiſh green colour, nearly approaching to red.

The upper part of the turnip has a reddiſh caſt, a thin ſkin, a handſome ſhape; and it is a ſweet-eating turnip, and the ſureſt of all others for a crop.

In ſhort, it is our favourite; but as it is an early turnip, it ought to be eat firſt; and a proportionable quantity of the Norfolk ſort ſhould be ſown, and kept for ſpring-feeding.

Thirdly, the yellow turnip. This is a ſmall ſort, and is chiefly cultivated by gardeners for the table.

It is a mild-taſted turnip; and the inſide, when boiled, is of a yellowiſh colour; it may be ſown in the field; but its growth is rather dwarfy.

The turnips of both ſorts ſhould be ſown at, or about, Midſummer, and rolled in, without buſh-harowing.

CHAP.

CHAP. XVII.

On feeding Bullocks with Turnips.

FEEDING bullocks on turnips, is another method practiſed by ſome farmers; but this falls ſhort, in profit, of the ſheep-feeding ſcheme; except they be conſumed on the land, in moving houſes; for though bullocks clear double their firſt coſt, and make as much produce out of an acre, yet the expence is greater in attendance, in the old method; for, as they are tied in a houſe, the turnips muſt be carried to them. Every twenty bullocks will take two houſes and two men to attend on them, when thus confined at home.

Again, the land loſes the benefit of the manure, being very conſiderable, in what it would gain by ſheep.

It is true, bullocks make ſome manure; but it is very inconſiderable; as the turnips paſs through them chiefly by urine.

The bullocks that are fed by turnips, muſt never be watered, nor go out of the houſe, from their firſt being put in, till they go to the butcher: for the turnips ſupply them with water enough; and if they be let at liberty to run or play, it will heat and diſturb their bowels; inſomuch that the turnips will paſs through them too quick, before they have time to fulfill their office by digeſtion.

Some farmers manure their meadow lands by feeding ſheep upon them with turnips; but though they gain in one place, they loſe in another; and they alſo add a multiplicity of labour and expence thereto, by pulling up and carriage; which they will very ſenſibly feel in fifteen or twenty acres of turnips: however, every one knows his own ſituation beſt. If he be diſtant from dung for his medows, this method of feeding ſheep upon them will give an excellent dreſſing.

CHAP. XVIII.

On preſerving Turnips good for Spring Feeding.

IT has always been a cuſtom among gardners, when they want to preſerve turnips, carrots, parſnips, &c. good for the table in ſpring, and to keep them from growing, to bury them in dry ſand.

Were we to take a curſory view of this method, without entering thoroughly into the merits of the cauſe, we might think it a very judicious way, and one that might be extended to the preſerving of theſe vegetables good for ſpring-feeding for cattle.

But, if we look more narrowly into this affair, and withal conſult reaſon, we ſhall find, that, inſtead of retarding vegetation by this method, it will forward the growth thereof.

Turnips are full of a juicy ſubſtance; and though the ſand be ever ſo dry, when thrown among them, yet they naturally ſweat when packed together; therefore they communicate a moiſture, which, together with the natural hot quality of the ſand, raiſes a ſtill greater heat; and every one knows that moiſture and warmth are two qualities which force vegetation, and the vegetations of ſuch roots is the firſt thing that helps to render them uſeleſs; for being out of the ground, they grow till all the growing quality be exhauſted; after which they putrify, and are not fit for food.

However general the practice of burying among ſand may be, yet the above are truths and reaſons, which muſt carry conviction along with them, to every reaſonable man. But thoſe who doubt it, can eaſily be convinced upon trial.

The eaſieſt and beſt method to preſerve any ſort of roots from vegetation, and ſo conſequently, to keep them longer good for food, and particularly turnips, is, to ſtack them up in ſtraw.

The method is ſimple and eaſy; one load of any ſort of dry ſtraw is ſufficient to preſerve an acre of fifty tons weight of turnips.

Throw the turnips in a ſort of a windrow, on the middle of each ridge, then let them lie a few days; and, let what weather will come, they will take no damage.

When you think there are as many pulled, as will make a heap as large as a large haycock, you muſt then make them up in that form with dry ſtraw.

Firſt, lay a layer of ſtraw next the ground, and upon it a layer of turnips about half a yard thick; then another layer of ſtraw; ſo go on alternately, laying a layer of ſtraw and a layer of turnips; every layer grows narrower, till it comes to nothing, at top, like a ſugar-loaf.

The laſt layer muſt be ſtraw, which ſerves as thatch to keep all dry.

You muſt obſerve always, when you have laid a layer of turnips, to ſtroke, or lap up the ends of the under layer of ſtraw over them, in order to keep them cloſe, or from tumbling out.

You ſhould have in readineſs, ſtraw in the field, made in little cocks, where abouts you think the heaps of turnips will be.

When they ſweat, the ſtraw, imbibing the wet or watery particles, prevents vegetation.

For want of ſtraw, old ſtack bottoms, ruſhes, or ſtubble, may anſwer the end, provided they are dry.

No one, that has turnips, but ought to follow this practice; as every one knows, that, if the weather be mild, they will begin to grow about the latter end of February; after which they grow, every day, worſe and worſe for feeding.

As the ſubſtance grows into the top, it leaves the turnip dry and woody; therefore the ſheep or cattle do not like them, and conſequently do not feed kindly thereon.

CHAP. XIX.

A Pickle to prevent the Fly from deſtroying young Turnips, and Smutty Wheat.

UPON looking at the head of this chapter, ſome of our readers may want faith to believe it; therefore in this, as in other caſes, it may not be amiſs to give ſome reaſons how the pickle operates, ſo as to prevent this malady; which few words may explain.

We ſuppoſe it would not be hard to make any farmer believe, that, were we to daub every leaf over with brimſtone, or ſuch like poiſonous obnoxious qualities, it would hinder the fly from preying thereon;

but, ſays he, how is it poſſible that ſteeping the ſeed (though in ever ſo obnoxious a liquor) can hinder them from preying upon the leef?

We muſt conſider, that the damage received from the fly, is, when the turnip is in its ſeed-leaf; the ſaid leaf being ſoft and tender, the fly feeds thereupon; and the bite thereof is very poiſonous to the plant, while in its infant ſtate.

But after it gets out of the ſeed-leaf, it is ſafe; becauſe the ſecond leaf is armed or covered with a kind of down or beard, that is ſo thick-ſet and pointed, that the fly cannot come near the leaf to feed thereupon; by which means the plant is preſerved.

Upon turning to the chapter on ſmutty wheat, you will ſee, that, for the very reaſon why the pickle prevents the worms from preying upon the root, and cauſing ſmut in wheat, for the ſame reaſon it operates upon the leaf in turnips, and prevents the fly from preying thereon.

The nature of a grain of wheat and that of a turnip are quite oppoſite; for the bran or huſk of wheat ſtays in the root in the ground, whereas that of turnip-ſeed riſes and opens into leaf.

In ſhort, the leaf of all oily plants is lapped up in the ſeed in miniature, and when raiſed into vegetation, the ſeed, as it were, unfolds or opens itſelf all into leaf; this is what is generally called the ſeed-leaf; and takes the form of a leaf upon it, though it is not laſting; for, as ſoon as the root begins to feed upon the ground, it throws out another of a harder kind, which, as before obſerved, is covered with a ſort of a down or hair; and then the ſeed-leaf falls off, or inſenſibly dies away.

Therefore it is no wonder that the ſeed-leaf ſhould retain an offenſive ſmell or taſte, which ſtrongly affects theſe diminutive inſects, whoſe ſenſe of ſmell and taſte are in proportion to their ſize; and the ſeed being ſteeped in a poiſonous, nauſeous liquor, the leaf, wherein lies their food, retains the ſaid nauſeous quality; which they are ſenſible of, and therefore forbear feeding thereupon.

We do not ſay that the pickle will kill them, though it is not impoſſible, ſhould hunger enforce them to feed upon it, which is ſcarce probable; but as it prevents them from doing damage, it anſwers the end deſigned.

However, to be more ſecure, we would adviſe always to ſteep one half of the ſeed, and to ſow the other half unſteeped.

Should the flies be very predominant and hungry, they will feed upon that which was not ſteeped, till the other has got into the ſecond leaf; and if one half grow, it will do more than ſeed the ground; for there are more grains in half an ounce of ſeed than ſquare feet in an acre, were they properly placed.

If a farmer ſows his uſual quantity of ſeed, which is a pound upon an acre, one half ſteeped in the poiſonous pickle, and the other half unſteeped, for the flies to feed upon, he need not fear a crop, be the flies ever ſo numerous, for the half pound that is pickled will be more than ſufficient ſeed for his land.

Some people will ſow half new ſeed and half old, which is a ſenſible way; for the new ſeed comes up three or four days earlier than the old; therefore, ſay they, the flies are feeding upon the new ſeed, until the old gets into the hairy leaf.

The Receipt.

To every gallon of old chamberlee, add three ounces of copperas, two quarts of train-oil, half a pint of the oil of turpentine, three ounces of the balſam of ſulphur, three ounces of nitre, one quart of bullocks gall, which may be got of the butchers, bruiſe and ſqueeze therein a dozen of heads of garlick, add as much ſoot as you ſee will make it of a thick ropy ſubſtance, in order that as much of the liquor as poſſible may be left ſticking about the grain, that it may gather a thick coat when mixed with the compound powder, which will both add to the manure, and be a preventive againſt vermin.

When all the above ingredients are mixed, add to the liquor two quarts of bay ſalt.

The longer all theſe are mixed before you want them, the better; becauſe they will then have ſufficient time to incorporate together, by which means the mild, ſmooth ingredients will ſoften or meliorate thoſe of a more harſh, churliſh nature; and be in leſs danger of their deſtroying the growing quality of the ſeed.

In this liquor ſteep your ſeed ſix or eight hours, then take it out, and preſerve the pickle for farther uſe; mix the ſeed with the following compound of powder, viz.

The compound Manure.

To every peck of aſhes, take half a peck of ſoot, half a peck of lime, and one pound of brimſtone in powder, mix all well together, and ſift it through a fine ſieve, in order to take out all the lumps; ſpread ſome of this powder on a table, thin, with a ſieve, (which will let through the ſort of ſeed you want to mix), ſift ſome of the ſeed over it, and mix or rub it with your hands, in order to candy it over with as thick a coat as you poſſibly can.

It is beſt only to mix a little at a time, and when it grows too dry, ſprinkle a little liquor over it again, until you enlarge the grains to the ſize you would wiſh, the larger the better.

If old, dry wheat be put into pickle, it will retain its growing quality a long time; becauſe the body is ſo cloſe, hard, and obdurate, that it reſiſts the keen, ſharp, and ſearching particles of the liquor, for a time, and only lets it penetrate by degrees.

Whereas on the other hand, if the grain be ſoft and full of water, its pores are all open and tender; therefore the ſharp particles of the liquor ruſh in, and ſeize it all at once, when in this open ungarded ſtate, and may do more hurt to the growing quality in one hour, than they would, in the former caſe, do in twenty.

The reaſon that this pickle does not ſo quickly affect, or deſtroy the growing quality of ſeeds, is, becauſe the ſharp, acid and poiſonous particles of ſome of the ingredients are checked, mollified, or let down, by the ſmooth particles of the oil, which does not deſtroy the force of thoſe ingredients.

Moſt people own, that oil is an antidote againſt poiſon; and alſo that, if ſpirits of turpentine, or ſuch like hot oils, be applied to a horſe, for a ſprain, or the like, they will fetch off the hair; but mixing them with any ſort of oil or greaſe, will prevent them from having that effect.

In ſhort, numerous hints might be given, to ſhew, how neceſſary it is to add oil to pickle, in order to ſmooth and qualify, and bring it to a proper conſiſtence, that it may not be injurious to the growing quality, was the oil of no other real uſe; but it certainly is.

The chief object of the aforeſaid ingredients being mixed all together, and called a pickle, is, to prevent flies, worms, or any thing that is of the nature of theſe ſpecies, from preying upon, or damaging our crops.

Moſt grubs or worms are the parents of flies; therefore what is poiſonous or obnoxious to the one, muſt alſo be offenſive to the other.

Now all the ingredients which compoſe the aforeſaid pickle, are, jointly and ſeparately, antidotes againſt either fly, or grub, or both; as for inſtance, rub a horſe over with train-oil; and, ſo long as the ſmell remains, a fly will not bite him; ſulphur, ſoot and chamber-lee, are alſo their averſion ? and ſo are lime, ſalt, turpentine, copperas, roſin, galls, and garlick, antidotes againſt the worm and grub tribe.

The above liquor is not expenſive; and will abundantly enrich the crop; particularly if the ſeed be well coated over with the compound powder; therefore we would adviſe it to be applied to the four following grains, viz. wheat, barley, turnip-ſeed, and India corn.

CHAP. XX.

General Pickles for Wheat.

THE following is a general pickle for wheat, to be uſed by ſuch farmers as ſow great quantities, and will not go to the expence of the above pickle and powder, viz.

Take a tar hogſhead; let it into the ground, with its top even with the ſurface, in ſome by-place, having a cover thereon.

In this keep chamber-lee, from one ſeed time to another; the older it is, the better: in this throw all the bullock, ſheep, hogs, or any ſort of galls you can get; the more the better.

In each hogſhead full of liquor put two gallons of train-oil, a great many heads of garlick bruiſed, one pound of copperas, one pound of nitre, and one ſtone of bay-ſalt; ſteep the ſeed therein eight hours, and ſkim off all the light ſeed that ſwims at top; then take it out, and, on a floor, mix it with quick lime and ſoot, of each an equal quantity, till it be of a conſiſtence proper for ſowing.

It has always been a maxim for farmers, to ſow new wheat; thinking that old would not grow; but they may reſt aſſured, that it is rather better than new, and particularly if ſteeped in this pickle.

And would they come generally into this method, of ſowing old wheat, it would ſave them a great deal of hurry and trouble in threſhing out ſeed wheat in the buſy wheat ſeed time.

But thoſe that ſow new wheat, we would adviſe them to have it as dry as poſſible, before they put it into the pickle. If the ſeed be well candied, no fowls, ſuch as crows, pigeons, &c. will touch it, neither will field-mice eat it.

We might add ſeveral other pickles, but ſince the above anſwers every good end of enriching the ſeed, preventing all ſorts of vermin, and worms, grubs, flies, &c. from damaging the crop; and as the ingredients are cheap, and may be got in any country-town, we think it would be in vain, to perplex the farmer's ideas with any other.

CHAP. XXI.

On feeding Cattle, &c. ſhewing a cheap Food for laying on Tallow, never before made public.

IF our reader has looked over the foregoing chapter, he will the ſooner preceive which ſort of food will expedite the feeding of his cattle quickeſt and cheapeſt; a conſideration every one ought to bear in mind.

The quickeſt feeding a beaſt can take, is linſeed oil and bran mixed.

If the cattle be but ſmall, give each two pecks of bran a day, divided into three feeds; which will ſerve morning, noon, and night; into each peck put half a pint of linſeed oil, mix it well.

The cattle will eat it very greedily; and it feeds them paſt conception; they muſt have what hay they will eat, but that will not be much.

The oil dilutes all the reſt of the food they eat, and as to itſelf, it all ſtays in the beaſt as fat.

Five gallons of oil, which will only coſt about ſeventeen ſhillings and ſix-pence, and the bran in proportion, will fatten a beaſt ſooner and more effectually, than five pounds expended in any other food whatever.

It is well known in Wiſbich, Lincolnſhire, a gentleman of the faculty in that town, fed a ſmall beaſt with this food which produced twenty ſtone five pounds of tallow; and the four quarters only weighed thirty-three ſtone; ſuch a weight of tallow in ſo ſmall a beaſt was prodigiouſly amazing; we have known it, in a manner, perform wonders with cattle in fattening them very quick; but nothing equal to this we have as yet to boaſt of.

Another method is, to mix two buſhels of bran to one buſhel of malt duſt, and one buſhel of peaſe meal; when all are mixed well together, and laid in a heap, ready for uſe, give each beaſt a peck at a feed, every night and morning, with half a pint of linſeed oil, mixed in each feed, juſt before you give it.

Moſt ſtock-maſters know that linſeed-cakes, from the oil-mills, are good feed for cattle; yet it is nothing equal in value to the aforeſaid food; becauſe there is a richneſs in the bran, &c. far ſuperior to the huſks of the linſeed; for, when the oil is all extracted, the huſks are of no uſe.

Such cattle as are fed upon theſe cakes, can be ſaid to feed upon nothing but oil, which they contain, and which the mill could not extract.

But admitting that cakes were as good food as oil and bran, (which they are not) yet the food cannot be general; it can only be practiſed in a very few places, near oil-mills; as it is of too heavy and bulky a nature to admit of diſtant land-carriage; whereas the oil, bran, &c. can be procured all over the kingdom.

After what has been ſaid, it appears plain, that every ſort of food is of value, according to the quantity of oily rich ſpirits it contains; therefore we would adviſe every ſtock-maſter, or farmer to pay due regard thereto, by providing food of the richeſt kind, for either his cattle or horſes, particularly for ſuch as he intends to feed; if the food be good, leſs will ſerve, and the cattle will be handſomer in ſhape and their bellies will be ſmaller; a large one looks very diſagreeable, either in the horſe or cow-kind; and it is chiefly the poorneſs of the food which cauſes it.

Keep a horſe on hay alone, and he will have a great belly; but give the ſame horſe a proper quantity of corn, and it ſhall be reduced to a moderate ſize.

If this was not the caſe, hunters and running horſes would have as big bellies as other cattle; but it is rich feeding which keeps them in proper ſhape.

The ſame obſervations alſo holds good as to graſs-land; therefore, when a farmer wants to take a piece of ground, he ſhould take notice what condition the cattle are in, that go thereon; if their hair be long, rough, and ſtickling, and their bellies large, he may reaſonably conclude the land to be poor and ſpiritleſs, the graſs it throws up to be deſtitute of oils or richneſs, ſufficient to ſatisfy the cravings of appetite, without taking in a great deal of groſs matter for that purpoſe.

On the other hand, if the cattle upon the land be ſleek and ſhining, the hair ſhort and lying cloſe, and the belly round and ſmall, almoſt like that of a running horſe, all theſe are plain and ſure tokens, that the ground on which they go is good, and the graſs rich and oily, which evaporates, penetrates, and enriches all the fluids of the body, and keeps them thin, hot, and lively, ſo conſequently the body in health and vigour.

CHAP. XXII.

Experiments made in 1764, by the Author, to find out the true diſtance, or quantity of Land that Wheat ought to have to grow upon.

IN 1764, the author finiſhed making his machine, that harrows, ſows, and rolls at one time; and as it would ſow any quantity of grain, on an acre, the broaſt-caſt way, he made a trial in the method of ſowing wheat thin; it being his opinion, that a great deal of ſeed was thrown away by the old method.

However, in ſome degree, he was diſappointed, becauſe it was the firſt week in February before the machine was finiſhed, therefore out of wheat-ſeed time; but, though late, it was tried with a little.

The middle of a fifteen-acre field was fixed on, which had three different ſorts of land in the length of a ridge, and was forty perch long. One end of the field lay low; the ſoil was a ſtrong, loamy clay; the middle was a high hill; the ſoil at top was a kind of clay-gravel, very ſhallow, and mixed with a middle-ſized paving ſtone.

The other end was not ſo low as the firſt; neither was it ſo ſtrong a clay; but was what we call a loamy ſand: upon the whole, it was very good wheat-earth; the top of the hill was more proper for barley than wheat.

This field had been much worn by long tillage, and was much inclined to weeds; the laſt crop, which was oats. was but indifferent, and full of weeds; but, in order to recover the land, and kill the weeds, it had been fallowed two years; in which time it had got ſeven plowings; upon the whole, it was in good order, and by far a better fallow than the common run: it got a thin top-dreſſing, of wet turf-aſhes (for he had no other) and harrowed them in with the ſeed.

Two ridges were very exactly meaſured; and, on the fifteenth of February, was ſowed fourteen ounces on one ridge; which, according to the meaſurement of the ridge, was at the rate of ten pounds to the acre; on the other ridge was ſowed twenty-eight ounces; which, according to meaſurement, was at the rate of twenty pounds to the acre.

The ground was very wet; and the horſes ſunk as far as the plow went; however, the ſeed was not trod in, becauſe it was ſown between the harrow and the horſes feet; but the harrow could not come over it the ſecond time, without making the ground in mortar; ſo that it was only harrowed once in a place; therefore more than half the ſeed lay bare, or uncovered; but as the ground and weather was wet, it ſoon vegetated, ſo that, except what the fowls got, it all grew.

Though the machine ſowed the grain pretty even, yet, as the land was rough from the plow, it tumbled into holes; and as the earth clogged or ſtuck to the harrow, it dragged ſome on heaps. But, however, all this afforded a better opportunity of proving the experiment for a future event. For, if each grain had been placed at a regular diſtance, they would have lain within about ſix or ſeven inches of each other; ſo that we could not have had an opportunity to know how they would grow at the diſtance of nine, twelve, eighteen, or twenty inches. But as they fell by chance, and irregular, it afforded matter for ſpeculation.

About ten days after the ſeed was ſown, it began to ſhew itſelf above the ground; from this to the time it had done ſtooling or branching, we ſeldom miſſed a day without a viſit to it; ſo that we cloſely obſerved all its ſtages, ſituations, or motions.

We meaſured, and noted every diſtance we could diſtinguiſh any alteration in the plant; and found, that, in general, where a plant had the moſt room, it made the moſt ſhoots from the root, particularly in the good ground, till it came to the diſtance of about eighteen inches, that is, about nine inches each way If they ſtood thinner than this, it made no great difference; becauſe the blades, not being above nine inches long, did not meet with their neighbour, to obſtruct each other in ſpreading.

For the nature of a plant of wheat is ſuch, that it grows perpendicular till it is weaned from the kernel, that is, till the flour of the corn has all grown into top and root; for it divides each way, and leaves the chaff or huſk in the middle, ſtanding perpendicular at the ſurface of the earth, reſembling a blown egg-ſhell.

As ſoon as all the inſide or flour is exhauſted; ſo that the blade or top has nothing to depend upon for nouriſhment but the earth, the two blades open, and fall flat on the ground at the two oppoſite ſides of the root; then, as faſt as the root gathers ſtrength, it throws or forces out more plants round it, till it forms a figure like a ſtar, or an open full-blown marygold; and thus the blades keep growing, and creeping along the earth, till they meet with ſome living obſtruction, as graſs, weeds, or corn; immediately after which they raiſe up the points of their graſſy blades, and give over ſtooling; and what is very extraordinary, though there ſhould be more room at one ſide of the root than the other, yet they all bear, as it were, harmony, and concur with each other, as if they were ſenſible of an affront put upon them by an encroaching enemy.

In rich, clean, good, well-tilled land, a plant of wheat may ſtool to fill eighteen inches ſquare; yet we choſe to fix the ſtandard to one foot ſquare in good land; as that will bring forth to maturity, from twenty to thirty ears, which we found to be as many as had ſufficient room to grow out of one root; thirty ears to full maturity from one root; but were theſe thirty ears to have thirty roots, in the ſame ſpace of land, they certainly would fall down, and what we call root-welt; but if they ſtood, the ears and grain in them would be ſmall and good for little;

this we have accountd for in an other place.

As we obſerved, the blades of a good ſtooling-plant fall, ſpread, and creep along the ground; but if it be crowded when young, it throws up a perpendicular leader or ſtraw, from the middle of the root; and though it be thinned afterwards, yet it never changes the firſt bad ſet it gets; but this perpendicular leader takes up all the crown and ſubſtance of the root. It is true, upon being thinned, it will throw out more ſhoots round about; but they will be ſmall, and good for little; and a ſtooling-root of wheat is not good, except the ears be near of an equal ſize. Though we had ſome ears that were only about three inches long; yet moſt of the good ſtooling roots had not an ear but what was from five to ſix inches long; for they were all nearly of one ſize.

We cut ſome of the leaders off, from thoſe plants that were likely to be bad ſtoolers; and we found that this was the remedy to make them ſtool well; therefore, it is a good thing to turn ſheep in, for that purpoſe, after weeding or thinning; which would make them ſtool amain. But the beſt method that could be taken with a crop of wheat, ſown in the old or new method, would be, to hoe it.

We had ſome roots, that produced upwards of fifteen hundred fold, having from twenty to thirty ears at a root; but this was all in the good land, at the loweſt end of the field, which was moſt inclined to clay; the wheat at the other end, that was inclined to a ſandy loam, ſtooled full as well; but the corn in the ears was not ſo plump or large, neither were the ears ſo long or well ſet, but ſloamy; and the chaſes ſtood thin and wide; conſequently could not produce, in the ſame length of ears, ſo many grains.

As to the middle of the land, which was a high gravelly hill, and a ſhallow ſoil, it was hard to find above fifteen ſtalks or ears from one root; however, the ears, though not quite ſo long, yet produced as much real ſubſtance as the beſt; for they were thick and well ſet, with a large bold grain.

This was all from the ridge that was ſown the thinneſt, at the rate of ten pounds to the acre.

As to the ridge which was ſown at the rate of twenty pounds to the acre; it was impoſſible to find a root with above ſeventeen ears at it, in the beſt part of the land, and ſo in proportion in other parts: this was the moſt convincing thing of all to the reapers and by-ſtanders, who were all helping to ſeek; and they found more on the thin-ſown ridge at thirty ears and upwards to one root, than on the other ridge at ſeventeen ears to a root.

CHAP. XXIII.

To prevent the rot in Sheep.

THE rot of ſheep is very common, and, in ſome wet ſeaſons and ſpots of ground, almoſt general; and though perhaps the malady is of as long ſtanding as the ſheep themſelves, yet not one of thoſe many authors who have wrote upon this uſeful creature, has handled this ſubject properly; that is, ſo as to point out, by philoſophy, the riſe and progreſs of the diſorder; and conſequently, all muſt fall ſhort of preſcribing a remedy for it.

The long experience the world has had, of the returning wet ſeaſons bringing on this malady, leaves it beyond a doubt that the riſe thereof proceeds from abundance of water; but how this water operates ſo, as to bring on this malady, is the queſtion.

Many arguments, both verbal and written, have been heard upon the ſubject; one aſſerting, that it proceeds from the ſheeps taking in, with their food, worm-ſprouts, and dirt, which is generally thrown up in great quantities in wet weather.

Others, that it proceeds from the ſheeps taking in, with their food, cobwebs, which are always very predominant in wet and warm weather, inſomuch, that the graſs is moſtly covered with them.

Others aſſert, in general terms, that rot proceeds from water; but without refining upon the ſubject ſufficiently enough to open our ideas, and prove where a remedy can take place.

The following ſhort lecture will

ſhew the improbability of the two firſt problems being the cauſe of rot; and alſo prove that water is the cauſe thereof, and where it takes place; which being fully known, the thing itſelf points out a cure.

There is no animal of the brute creation, (ſuch as we have in England, or indeed any where elſe) that will live ſo long upon dry food, without water, as ſheep, rabbits, and hares; neither are there any creatures that are ſo ſubject to rot, as theſe.

A ſheep may be reared upon the higheſt and dryeſt lands, in the hotteſt ſummers, and never deſire water; and yet they will drink, if they come where it is; they will alſo bear a great deal of water, if it be proportionally mixed with ſalts, as appears by their living and feeding upon turnips, which are a very watery root; but then this is mixed with a proportionable quantity of ſalts.

There is likewiſe no ſort of graſs that grows up more quick, or is fuller of water, or juices, than that which grows on ſalt marſhes, on ſuch land as has been either gained from the ſea, or where the ſea ſometimes overflows; yet ſheep will never rot upon it.

So far from that, ſheep have been often known to knit or recover (which has been tainted aforetime) when put thereon; the reaſon is, that, though ſuch graſs be full of water, yet it is alſo full of ſalts, which by checking the redundancy of the water, prevent its doing of the miſchief by rot it otherwiſe would, and which is generally done by waters that are diveſted of ſuch ſalt particles.

Having given theſe hints, we ſhall proceed to ſhew where and how the rot takes place.

The word rot, ſignifies a putrefaction, or a decay of the liver.

The animal body is enlarged in the various ſorts of fat, lean, blood, bone, &c. by a vapour or ſteam, that ariſes from the maw, and which diſperſes itſelf as ſuch, through the whole animal body.

The mouth is to take in food, and the maw is a repoſitory where it remains, till the heat thereof brings on a fermentation; after which comes a corruption, and then a digeſtion, which is a ſeparation of particles into the ſmaller bowels, where there is a ſtill greater degree of heat, which cauſes a rarefaction; that is, it rarifies, and ſeparates the moſt oily rich particles of the food, from thoſe of a more barren nature.

Theſe latter are voided as excrements; but the former penetrate or evaporate through the ſkin of the bowels, in a ſteam or vapour, and are diſperſed to different parts of the body, ſome as bone, ſome as fat, ſome as lean; and others as water or urine into the bladder.

In all evaporating matters, that of the moſt corroding nature flies off firſt; and this is what lays on, or feeds the bone; the next degree lays on the lean and the ſinews; and that of a more mild, ſmooth nature, lays on fat.

Theſe, being the richeſt particles that are impregnated with food, are the firſt that riſe into a ſteam, are rarified and thinned into very fine particles, and then penetrate through the whole ſkin of the bowels, and are diſperſed through the whole frame of the body, and adhere to each part, according to its nature, as aforeſaid.

The next ſubſtance, that paſſes or evaporates through the incloſure of the bowels, is water or urine; and as all food is mixed with a greater quantity of this than the aforeſaid refined matter, the diſcharge is quicker and larger in proportion.

If the food be mixed with a redundancy of water, and be deſtitute of a proper quantity of ſalts to digeſt the water, the animal muſt ſuffer thereby.

Becauſe it is the ſalts that open the pores of the ſkin, or incloſure of the bowels, and alſo that of the bladder, and make paſſages for the water to paſs therein.

For there is no viſible orifice for ſuch a diſcharge out of the bowels into any part of the body, from the mouth to the fundament; neither is there any paſſage, by any viſible orifice into the bladder, but through the neck of it; and this is purpoſely for the diſcharge or emptying of the bladder, and not for taking in water; for the water enters the bladder through the ſkin, by an evaporating ſteam; and it is the ſalt particles that divide and open the ſkin of the bladder, and make it porous; which gives admittance to the water.

But ſhould the water be of a poor thin quality, and deſtitute of a ſufficient quantity of ſalts to keep it alive and active till it enters the bladder, in ſuch caſe it falls upon the liver, in large drops, and, not having ſalts thereamong to check it from doing harm, and being in a hot ſituation, it ſcalds, as it were, and wounds the liver, under each drop of water, which ſoon turns to decay.

The point of the liver is generally firſt affected; and the reaſon is, becauſe it lies neareſt the maw, from whence this evaporating water proceeds; it is alſo of the coldeſt, deadeſt nature; being fartheſt from the heat of the blood, which flows more rapidly in thoſe blood-veſſals that are more large and plentifully placed in the thick part of the liver, and which are near the heart: and therefore that thick part of the liver has a greater chance to reſiſt, or work off the wounding water; which it does, until it comes in too great abundance for nature to withſtand; in ſuch caſe the ſheep cannot long ſurvive it.

The graſs that is impregnated with this poor unſpirituous water that rots the ſheep, is ſuch as grows in low ſwampy places, and which perhaps is forced up in one night's time; in wet and warm weather, it ſprings up ſo rapidly (muſhroom-like) that it has not time to collect the ſalts of the earth, to bear a part in its compoſition, but conſiſts chiefly of the rain-water that perhaps fell the night before, and which (as obſerved in ſome other parts of this work) had juſt undergone a rarifaction, or dividing of the ſalts from the water, in the firmament.

This frothy graſs may be known by a large drop of water ſtanding at the top of it; the ſheep eat the ſaid graſs greedily up, and with it ſwallow a great deal of the ſaid water, which being incloſed in the maw, heats, and evaporates into a ſteam, and not having a ſufficiency of ſalts intermixed therewith to perform the office of digeſtion, by opening the different paſſages, as before hinted, likewiſe to keep the vapour or ſteam alive and active till it enters the bladder; but we ſay, for want of ſuch a proportionable quantity of ſalts, it falls upon the liver, and rots it as aforeſaid.

It is the rain-water, which has juſt undergone a rarifaction, or a dividing of the ſalts therefrom, in the firmament, deſcends and is taken up into the body of the ſheep, by means of the aforeſaid frothy graſs; and then it falls upon the liver, and wounds it.

Admitting that this is the caſe, as it certainly is, a cure, or at leaſt a preventive, ſpeaks for itſelf, namely ſalt. This is what will certainly prevent the rot, if timely applied, without any aſſiſtance from other ingredients.

Our method is, when we ſuſpect a rotting ſeaſon, to give ſheep, each, a ſpoonful of dry ſalt twice a week. This quantity is ſufficient to temper and molify all the food that is taken in: it mixes among the food, in the maw, and evaporates among the watery particles through the body, and prevents their wounding the liver, by giving them a quick paſſage into the bladder.

By this ſimple and cheap application, you take away the cauſe of rot; and the ſucceſs is not doubtful, but certain; and by frequently uſing your ſheep to it, they will in time, learn to lick the ſalt, of themſelves, if you lay a little upon a flat ſtone, in ſeveral parts of their paſture; they are by nature fond of it; therefore if you once get your flock accuſtomed to it, the trouble is over, and you need not fear having a rotten ſheep on any land, or in any ſort of weather.

Let no man deſpair of ſucceſs from the above application of ſalt alone, as it has been proved, both by reaſon and experience, to be effectual.

Miſtake us not, we do not mean that it will cure all; though it is clear the ſalt will prevent all from rot, if applied; for if the thick part of the liver, that is ſeated among the blood-veſſels and near the heart, be once tainted, you may as well offer to bring the dead to life, as cure ſuch; though at the ſame time, thoſe which are not above half-rotten may be prevented from going farther; and the liver, as far as is rotten, will knit; ſo that the ſheep will ſtand feeding the enſuing year.

We do not mean that the farmer can ſee into his ſheep which are curable and which are not; by applying the medicine to all, if he ſave ſome, he is well paid, ſince it is cheap and ſimple. Many poſitive people, who can judge no farther by reaſon than they can ſee with their eyes, condemn us for pretending to cure the rot in ſheep, a thing they think impoſſible; on ſuch our labour is loſt; and they have no advantage, becauſe their faith will not let them try the medicine.

Others may apply the medicine; and ſome of their flock may be too far gone for cure, therefore die; the farmer ſees this with his eyes, he knows he applied the medicine to theſe ſheep; he ſees them dead, and upon opening them, he finds them rotten. Here again we ſuffer in his opinion, for the ſheep that live he immediately concludes where not rotten, ſo no thanks to the medicine for their cure.

We once were preſent at a table, in Lincolnſhire, where ſat about twenty-five farmers, moſt of whom lived near the ſea ſide, where their ſheep went upon ſalt-marſhes.

There were ſome others that came out of the rotten-ſheep country, and were then at a fair, buying ſheep, to replace their ſtock, that were gone off by the rot.

So that the diſcourſe naturally turned upon the ſubject of rotten ſheep, with their cures, land, &c.

There were various opinions on the ſubject.

It happened that there was one man in company, who had ſaved his ſheep from the rot, by giving them ſalt, which he advanced as a truth; but it was looked upon as a chimerical ſtory, by thoſe who came out of the rotten country.

In ſhort, it was agreed by all the ſalt-marſh farmers preſent, that ſheep will not rot on a ſalt-marſh; that it is rather a remedy for the diſorder, if not too far gone.

Salt is a very wholeſome thing for all ſorts of cattle, it not only keeps them cool and open in their bodies, by giving a quick and regular digeſtion to their food, but it is an antidote againſt grubs and worms, and alſo a preſervative againſt every diſorder or infection.

It would be well done of every farmer or ſtock-maſter, to give their cattle a handful if dry ſalt every now and then, or to learn them to lick it off ſtones; which they ſoon will do, with a little trouble, if placed up and down their paſtures.

CHAP. XXIV.

A few Remarks made in the Weſt of England.

BEING glad both to give and receive any inſtructions that may be of utility to the public, for the improvement of agriculture, when upon our travels, we wait upon ſuch gentlemen-farmers as are beſt able to ſatisfy our curioſity, and take advice.

And as we are well convinced of the great advantage that would accrue, not only to the huſbandman, but alſo to the public in general, could the farmers be prevailed upon to put in practice trench-plowing, and ſetting the ſeed regularly.

We generally introduce thoſe ſubjects, and are as often anſwered, that ſetting the ſeed grain by grain, would be too tedious and expenſive; and as to trench-plowing, their land will not bear it.

We have ſometimes ſtarted this ſubject among a company of farmers; and have had the ſatisfaction to find ſome of them quote circumſtances to back our arguments; two or three of which are as follows:

Mr. William Lacy, of Ropley, in Hampſhire, ſaid that he had a piece of thin chalky land, which, a few years ago, he plowed in a very dry time; his orders, to the plowmen, were to plow it as uſual, perhaps not above two or three inches deep, for fear of coming too near the chalk, which would ſpoil the land.

However, as the ground was extremely hard and dry, the men could not obey their maſter's orders; for, inſtead of three inches, the earth broke up from the bed of chalk, and turned up in large furrows, perhaps a foot thick.

The farmer, as well as his neighbours, thought the land was ſpoiled for ever; but, contrary to his expectations, he never had ſo good crops on that ground before, as he had both that year and ſince.

The like caſe happened to one Farmer Baker, not far from Warminſter, Wilts. For though the land broke up from the chalk, yet it brought better crops after this deep plowing than before.

A gentleman-farmer, near Froome, in Somerſetſhire, plowed a piece of ſtrong clay land, in a dry time. His intention was to plow it thin; for as it had a white clay under the corn-mold, he was afraid to turn it up, leaſt it ſhould ſpoil the ground. But, contrary to his deſire, the ground roſe in large thick furrows, and brought up much clay with it. However, the clay melted with the ſun in ſummer, and the froſt in winter; and both the ground, with the crops upon it, have been much better ſince, than before.

Mr. Davis of Frampton, in Dorſetſhire, a very worthy gentleman-farmer, plowed a piece of down-land, much deeper than common, and his crops were a great deal better for it. The particulars of this experiment are forgot, but well remember the ſubſtance, as it cauſed a laugh in the company at dinner.

We, as uſual, was extolling trench-plowing. but Mr. Davis was not without a great many doubts and fears that his land would not bear it. However, in the midſt of his ſcruples, he recollected the above caſe, which had happened to himſelf.

Mr. Ingram of Clarendon-park, near Saliſbury, Wilts. rents a down farm. He has a large field near his houſe, which he fallowed. The ground was very full of weeds and ſcutch-graſs, and he had taken a great deal of pains to deſtroy them, by plowing, and harrowing it many times over. At that time he was burning the weeds, and ſuch rubbiſh as was harrowed up.

He was told he might have improved the land much better, and with a great deal leſs expence, if he had trench-plowed it, for by that means all the ſubſtance of the weeds would have remained in the ground, and turned into a rich manure; whereas by burning them, ſuch enriching qualities are evaporated.

In ſhort, it was explained to him the whole method and value of trench-plowing, which he ſeemed to liſten to with attention, but was not without his doubts and fears, that the ground would not bear it; however, thoſe doubts were ſoon removed, by trying the ground with a ſpade.

a ſpade. But what ſtrengthened the argument the more, was a garden which had been incloſed from the ſaid field. He ſaid, that for ſome years after the garden was incloſed, it produced very bad crops. Every thing that grew in it was ſmall and runtiſh; neither could the ground be kept free from weeds. A gardener told him, as a great ſecret, that if he would have good crops, he muſt trench to the depth of three ſpade-grafts deep, and throw to the bottom all the upper mold which contained the weeds. He did ſo, and ever ſince it has been the beſt garden in the country.

When he conſidered well the whole affair, he liked the ſcheme; and immediately got a plow made according to directions; and as wheat-ſeed time was then coming on, he trench-plowed the land on which he ſowed his wheat. He allowed to each acre only, about half the quantity of ſeed that is commonly uſed. And, at that time, there was not a crop in the neighbouring county that looked ſo well as his, which was then March.

Many farmers, hearing of his proceedings, came to ſee his trenched land and crop; and every one approved of it; and that he knew a great many who were then getting trench plows made from his pattern, and that he was ſure it would gain ground amazingly. Thus he ſpecified the laſt time we ſaw him.

Mr. Hardy, of Martin's-town, Dorſet, is a very conſiderable gentleman-farmer, and ſeems to be indued with talents and a ſpirit for improvement. He was ſhewn how to alter his plow, for the purpoſe of trench-plowing.

Mr. Thomas Nicholls, of Burton, Dorſet, is a conſiderable gentleman-farmer; and one that ſeems to excel in huſbandry. He was ſo much bent upon this method of trench-plowing, that he offered our plowman thirty pounds a year; which, by the by, we did not thank him for, as it has made the man ſaucy ever ſince.

William Helyar, Eſq; of Coker, in Somerſetſhire, a gentleman fond of improvements, is alſo determined to begin the method of trench-plowing.

Upon looking over the memorandum book, we found no leſs than two hundred and twenty-nine, to whom we have ſhewed how to alter the plows for trench-plowing; and who ſaid, they would abſolutely put it in practice.

CHAP. XXV.

On thin Sowing, &c.

AS in the laſt chapter is given ſome favourable hints upon deep plowing, gathered from ſeveral counties; this chapter, in like manner, will prove the value of thin ſowing, which particularly deſerves the farmer's attention.

A tradeſman in Glioceſter, has one acre of land, which lies within the turnpike. The ſame has been ſome time occupied as a garden; but it being overrurn with weeds, he was adviſed to ſow it with wheat, and lay it down with graſs-ſeeds, which accordingly he did; but contrary to the common method; for he bought a peck of wheat, and after the land was properly tilled, hired two women to ſet it grain by grain, with ſetting ſticks.

They uſed only ſeven pints of the ſeed, and finiſhed the acre in thirteen hours.

They had orders to make each hole nine inches aſunder, and in each to drob one grain of corn. However, as they had no regular rule to go by, they might err in the diſtance, and alſo ſometimes, put more grains than one in a hole.

The ſeed was ſet in February, and the land hoed in April, to keep down the weeds, which ſprung up very plentifully. Clover ſeed was ſown immediately after.

In July, the crop was remarkably good; but had it been kept clear from weeds, the clover would have been much better, as it was much crowded.

The ſtraw was at leaſt ſix feet long; the ears, in general, about ſix inches long, and contained, upon an average, about eighty grains each.

Several hours were ſpent in counting how many ears ſprung from a root, which varied, all the way, from fifteen to thirty. So that, upon a medium, each root through the acre, taking one with another, produced twenty ears.

It was believed, by all judges in corn, that the acre would produce, at leaſt, fifty Wincheſter buſhels.

The Rev. Mr. Sandys, Rector of Yeovelton, Somerſetſhire, ſet a piece of ground (in quantity about an acre and a half) with wheat, grain by grain, in the ſame manner as they dibble beans. It took a peck and a half of ſeed; the labour coſt half a guinea. The produce was eighty buſhels of clean corn, Wincheſter meaſure.

A gentleman, in Warwickſhire, ſet four acres olſo, grain by grain. The ſeed it took was three pecks and a half. The labour coſt ſeventeen ſhillings and ſix-pence. The produce was two hundred and two buſhels of clean corn, Wincheſter meaſure.

A gentleman, near Newcaſtle-upon-Tyne, ſet ſome naked or Siberian wheat, one foot aſunder each grain; it produced about two thouſand fold.

In ſhort, were we to inſert all the experiments of the ſort, which have come to our knowledge, they would fill a volume: neither is there any neceſſity for it; as every ſenſible man will admit, that, if an experiment will ſtand good for one acre, it will for any greater quantity.

It is only enlarging the ſcale, and keeping up to the rules; and fear not but that the produce will be the ſame in proportion.

Would all the farmers in the kingdom, come into this ſaving method, of ſetting the ſeed, it would be one ſtep towards reducing the price of proviſions; as it would ſave annually, at leaſt, a million quarters of corn; which, by the preſent method, is thrown away, and loſt to all intents and purpoſes.

The money that would be paid for labour, to make this ſaving, would go in a direct channel to ſuch of the women and children as would otherwiſe be idle.

CHAP. XXVI.

To improve Ground, deſtroy Whins and Broom, and, at the ſame time, raiſe a valuable Crop of Potatoes.

AS much land as there lies, in a manner, waſte, through his Majeſty's dominions, by being overrun with whins, we have not as yet ſeen any method found out to eradicate them, but by ſtrength of men and money; however, what is to follow, may ſhew the great treaſure that may be made of them, by thoſe, who, perhaps, formerly thought them a nuiſance, and, with great expence, have ſtrove to be quit of them.

Some burn the tops on the ground and ſtub up the roots by men, at great expence; others (who think themſelves, perhaps, at the height of improvement in this matter) tear them up with ſtrong plows and horſes. But, if they conſider what a vaſt body of manure they ſend into the clouds, and deſtroy, they certainly would be angry with themſelves for ſo doing.

Particularly, when they once try the valuable method of ſetting potatoes on them; they will then ſee, that the ſap they contain is a very rich manure, which, when, ſmothered, quickly rots: it will enrich the ground paſt imagination, and, at the ſame time, raiſe a valuable crop, with very little expence.

The ſecond crop (for it will bring two) will not be much inferior to the firſt; and it may be got with very ſmall trouble or expence.

After the ſecond crop of potatoes

is off, if the ground be ſtrong, it will bring a good crop of wheat or beans; or if light and ſandy, barley or rye.

The firſt thing that is to be done, is, to cut away through the whins, where the trenches will fall, then ſtretch a line to the breadth of the ridge you fix upon; if your ground be a deep good ſoil, the ridge may be broad, and the trench ſo deep, as to afford earth enough to cover the whins four inches thick.

The moſt general breadth of theſe beds or ridges, is nine feet; and the trench or furrow, two feet: ſo that two ſpits deep and a ſhovelling, will give the covering required.

Tread down the whins, before you lay on the earth, ſo as to make them fall cloſe one way; if they be not very ſtrong ſtalks, treading and the earth will keep them down; but if the ſtalks be too groſs, give them a nick cloſe to the root. All the whins you cut up, where the furrow falls, you muſt lay on the ridge, in the moſt vacant places you can find; as there are few cloſes ſo full of whins but have ſome bare ſpots; therefore what is cut from the furrow will make up the deficiency of manure; as they will now act in that ſtation.

But it matters not how ſtrong or rank the whins are on the ground: if they be ſix feet high in one continued bed, the better, and the more manure it will afford your land.

There is no method yet found out for deſtroying whins, equal to this; as to fallow, they often grow after, in ſpots; but they are effectually ſmothered, when properly done thus.

The longer the ground is trenched before the potatoes are ſet, the better; that the whins may have time to rot and ferment with the earth, they ſhould be trenched under, about

Michaelmas, and the potatoes ſet in April following.

Holes muſt be made, nine inches aſunder, with a ſetting-ſtick, to let the ſeed down to the whins. In order to make the ſtick ſink the eaſier, fix a pin acroſs, ſix inches from the bottom, to ſet the foot upon, in the nature of a ſpade.

And as you make the holes, any children will follow, and drop in the ſeed.

After they are ſet, rake the land over, to fill the holes.

When the potatoes are juſt beginning to peep above ground, ſhovel the furrows, and throw the looſe earth over the bed; which will give it a thin covering; all the looſe earth that the ſpade leaves in trenching, muſt be reſerved at the bottom of the furrow, on purpoſe for this uſe.

When you dig out the potatoes, gather them as clean as you can;

there will ſtill be ſufficient ſeed left in the ground for a ſecond crop; do not raiſe any of the whin-ſtalks; but leave them in the ground.

When the potatoes are up, ſhovel the trenches, and leave tke ridge ſmooth, and covered up all winter.

If there be not a very hard froſt, you will get a ſecond crop, without any more expence; but if the froſt be ſo hard, as to rot the ſets in the ground, all you have to do, is, to ſet them over again in the ſpring; and after they are ſet, rake, and fill the holes, as you did the firſt year.

It is by far the beſt, to take two crops; becauſe the ſecond is got for little expence; and it gives a ſufficient time for the whins to rot, and the earth to meliorate.

The ſtalks and roots of the whins will be ſo rotten, as not to reſiſt the plow; therefore you may plow up the ſecond crop of potatoes, and till the ground, either for wheat or barley;

ley; which cannot fail of a crop, after ſuch a rich dreſſing.

This is an excellent method to improve common land that is covered with whins, ſhould there be a general incloſure, which is now in agitation.

What whin ſtalks remain undecayed may be gathered up after the plough.

CHAP. XXVII.

A compound Manure to improve Land, and alſo to prevent the Red or Cut-Worm, and the Slug from deſtroying Green Corn, &c.

IF our pickles for wheat or turnip-ſeed be duly attended to, and the grain candied with a thick coat of manure, it will be a great means to prevent any inſect of the worm, grub, or ſlug-tribe, from preying upon the crop, for it is ſo extremely offenſive to them, that they do not care to ſtay in the root where it is; except the land be very full of them, and other food, ſuch as weeds, graſs, &c. be ſcarce; in ſuch caſes, hunger may force them to eat what they did not like; therefore we ſhall propoſe other remedies, that will more immediately fall upon their food, and prevent them from eating thereon; but ſhall firſt give a deſcription of the grub that does the moſt damage to corn in its green ſtate.

The cut-worm, or by ſome called the red worm, is of the grub or maggot-kind; it is about three quarters of an inch long, and is about the eighth of an inch in diameter; the body is of a pale yallow colour; but its head is almoſt black, or of a deep red; it has a ſort of feet, but, by nature, is extremely helpleſs as to motion or movement; one can ſcarce ever ſee it creep; if a plow or ſpade throw it above ground, it is long before it can get itſelf again covered with mold.

Therefore if land be often turned up with plow, harrow, or other inſtruments, theſe worms are quickly deſtroyed by the fowls of the air, when expoſed thereto.

Their food lies in the roots of graſs, corn, or other vegetables, which are ſoft and juicy, the greateſt damage they do to green corn is, from about the beginning of April to the latter end of May.

They cut the corn off, as if cut by a knife, about an inch within the ſurface of the earth, ſo that the corn dies away, and the crop is entirely loſt.

We have ſeen a cloſe, containing twenty acres of wheat, which was a fine crop, the latter end of April, but by the latter end of May was all deſtroyed, ſo that the land was obliged to be plowed up in June.

In ſhort, they are a very deſtructive creature; we have tried many experiments to prevent the crop from being deſtroyed by them; but found none ſo effectual as the compound manure as follows, viz.

To every ten buſhels of ſoot, mix ten buſhels of any ſort of dry aſhes, ten buſhels of unſlecked lime, and ten ſtone of bay-ſalt.

Take out of the hogſhead five gallons of the pickle for wheat, and add to it five quarts of galls, which you will get at the butchers for eightpence a quart, and five gallons of train-oil; mix theſe together, having all the above articles ready provided in ſome out-building, (for they muſt be kept dry) have three or four perſons to mix them.

Firſt, ſpread on the floor a layer of aſhes, then a layer of lime, then a layer of ſoot, then a layer of ſalt; a perſon, all this time, muſt be ſprinkling, on the liquor, in order to mix every thing as even as poſſible together.

Being thus mixed, be provided either with a cart-load of dry aſhes, or, for want of theſe, a cart-load of fine dry-mold out of a fallow field; with which the compound muſt be cloſe covered, in order to keep in the ſteam or vapour, which will naturally ariſe from the heat of the lime when ſlecking, and the reſt of the compound fermenting together.

When thus mixed and covered up cloſe, let it lie three or four days, or longer, if you do not want it; in this time, the lime will be ſlecked and fallen to powder, and the heat thereof will dry up the liquor; ſo that when the compound is turned, and well mixed, it will be a dry powder.

In turning and mixing the compound, you muſt mix along with it the aſhes or dry mold that covered up the heap; when thus mixed, let it lie a few days longer, in order to incorporate together, as the longer it is made before it is wanted, the better; for it improves by age.

Chuſe a calm dewy morning, or

evening, to ſow it in; the duſt falls upon the blades of the corn, and being wet, it ſticks thereto, and the next rain or dew that comes waſhes it down the ſtalks to the root; the nauſeous poiſonous quality of which prevents the grubs or worms from feeding thereon; and alſo being a rich manure, it encourages the growth of the corn amazingly.

CHAP. XXVIII.

Directions for keeping Horſes dry and clean without Litter, as in America.

THIS may ſeem ſtrange to an Engliſh reader, however, it is very common in America for horſes to ſtand and lie upon ſtages made of boards, without litter. Indeed at the firſt glance it may ſeem an uncouth, hard-hearted method ; but a very little philoſophy will ſhew the utility to any rational thinking man. The chief objection that can be made againſt it, is the hardneſs of the bed ;—but a hard, ſmooth, even bed is much eaſier than a hard lumpy one, as muſt be the caſe when on the pavement, if not well littered; beſides, nature never intended that cattle ſhould have beds, if we leave them in the fields from their births to their deaths, they would never take cold, or be ſo ſubject to diſorders, while kept in their accuſtomed elements, it is the change of the climate, by way of keeping them in different ſituations that perverts nature and brings on diſeaſes.

In ſome ſtables horſes are kept littered up to their bellies all night; this heats their legs and cauſes the fluids to circulate downwards; at other times the litter is thrown under the manger, and the creature ſtands from morning till night on a cold wet pavement, and being ſometimes accuſtomed to litter, they will not lie down till it is thrown under them. It is alſo well known that nothing will ſooner give a horſe greaſe than long ſtanding, a good lying one ſeldom has this diſorder.

A horſe that always ſtands on a clean, even, dry boarded floor, knows no change, neither does he look for any other bed; he will lie when nature requires it, he has not the cold wet pavement to lie on for ten or twelve hours together, and then littered to heat his legs. Whereas, this is all avoided by the ſtage, for on it he is always kept clean and dry, and in one temperature.

In Philadelphia no litter is made uſe of, the horſes ſtand on boarded ſtages, and cattle are clean and bright, one is ſcarce ever ſeen with a wet dirty hip. In ſhort, reaſon and experience for ſeveral years together, both in America, and ſince our arrival in Europe, has ſo thoroughly convinced us of the utility, that were we to have ſtraw for nothing, we would prefer a boarded ſtage in our own ſtables, but in the caſe of travelling, we muſt ſubmit to the cuſtoms of the country.

CHAP. XXIX.

Directions how to make the ſtage.

THE Stage muſt only extend twelve inches farther back than where the horſes hind-feet ſtands, when he is eating at the rack by which the dung, when it drops, will in general fall off the ſtage; but ſhould any drop by chance on the edge of the boards, it is ſoon ſwept off.

The joiſts on which the boards are nailed, muſt be three inches thick, and four deep, and be laid on the pavement within a foot of each other, the boards muſt be an inch thick, and plained on the upper ſide but not cloſe jointed, leaving them rather open to let the water through it falls, without ſpreading over the ſtage; by which it is ſoon dry. It is beſt to part the ſtables into ſtalls, to prevent the horſes from turning round to dirty the ſtages, where they ought not.

Thus a ſtage may be made at a trifling expence, and may be laid over an earthen floor if neceſſary, with a ſmall drain to carry off the water.

CHAP. XXX.

On raiſing Tobacco.

THIS is a profitable crop, eaſily managed, and in the climate and lands of England, may he brought to as great perfection as in North America.

It is true there is an act ſubſiſting which prohibits ſowing any great quantity in England. However, ſince we loſt America, it is little notice taken of, before that time, it was ſtrictly obſerved to be kept under in England, in order to encourage our own plantations in America.

It is amazing what an immenſe quantity is deſtroyed in England and Scotland, by ſmoking, chewing, and ſnuff, particularly among the lower claſs of people, for the quality in general have left it off, or at leaſt prevent their offspring from making uſe of it.

The lower people in Ireland and Scotland are generally infatuated to it, they would almoſt as ſoon want a meal's meat, as tobacco, and would much rather go barefoot than be without it; we are confident many in thoſe countries that go without ſhoes and ſtockings, deſtroy more money in tobacco than would keep them in theſe articles; in ſhort, it is a fooliſh, dirty, unmeaning cuſtom, which ought to be aboliſhed by every perſon of ſenſe, having no good quality attending it; for though it has its perfections as a medicine in ſome diſeaſes, yet they are all loſt to thoſe who make a common uſe of it, for by general practice any effects as a medicine, is entirely done away.

Any one who has even a ſmall garden, may, at little expence or trouble, raiſe what would ſerve a family, the ſeed being very ſmall, an ounce will produce more plants than will ſtock an acre.

The ſeed muſt be ſown on a cucumber-bed, about the middle of March, and when it has grown into two leaves, about three inches high, prick out the plants into beds at ſix inches a-part from each other, and in about a month's time, they may be removed into rows, each plant two feet aſunder, and the rows at three feet diſtance from each other, cut up the weeds with a hoe, and draw the mold to the ſtems of the plants at different periods, as you ſee neceſſity requires to kill the weeds.

Some of the outſide leaves will be ripe before the reſt of the crop, which may be known by the edge of the ſaid leaves turning yellow, thoſe muſt be ſtripped off and hung up in a barn, a barn, or under any cover, ſo as to keep them from rain, tie three or four leaves together by the thick end with a ſtring; theſe are called hands; hang them upon nails, or a-croſs ropes or rails to dry.

When the plants begin to bud for ſeeding, go among them and nip the buds off between your thumb and finger, all, except what you intend to ſtand for ſeed, this will make them ſtrike more into leaf, and the leaves will grow longer and broader, which is the greateſt perfection in tobacco.

The crop is all ripe for gathering when the ribs of leaves neareſt the ſeed (which keep the longeſt green) will bend or double cloſe together without breaking, then you may fall to work, ſtrip the leaves from the ſtalks and tie them in hands as above obſerved, three or four together, and hang them to dry, but take care they hang looſe and open.

They muſt alſo be looked amongſt and turned often, or they will mould, rot, and ſpoil, which is often the caſe in great quantities, if pinched for room where it is ſcarce.

In America they have tobacco houſes that are large buildings like barns, they hang the tobacco on nails, ropes, &c. and make a fire on the middle of the floor to dry it, particularly if the weather be wet and hazy, which often happens about tobacco harveſt.

When the leaves are firſt ſtripped from the ſtalks, in the fields, lay them in rows, and let them remain two or three days in the ſun to whither, taking care to turn them every day, or the under ſide will mould, after which make them in hands for hanging to dry.

When dry, lay them in beds four or five feet high, and the breadth the leaves take in length; this is to give them a ſweat; but care muſt be taken not to let it turn to a white mould;

to prevent this, the beds muſt be turned or made over again, beginning at the upper row, and lay them on the ground, hand by hand, and thus it muſt be turned as often as wanted till it becomes dry and of a brown colour, after which it muſt be packed very cloſe in hogſheads for uſe.

There are ſeveral ſorts of tobacco, ſome grow ſmall or dwarfy, the plants not above three feet high; there are others that will grow to be ſix or ſeven feet high; and the largeſt leaves eighteen inches or two feet long. Oronoco ſeed is the moſt proper for the Engliſh climate. When the ſeed is properly ripe, it will as eaſily thraſh out as muſtard ſeed.

CHAP. XXXI.

On the Advantage of Dibbling Wheat.

Being an Extract of a Letter from Mr. Charles Varlo to Lord Viſcount Cremorne, dated London, 21ſt June, 1794.

My Lord,

I FLATTER myſelf you will be ſo kind as to lay before the Board of Agriculture, of which you are a member, one of the moſt valuable improvements that, perhaps, ever appeared in that ſcience, viz.

The method of ſetting corn, grain by grain, as at preſent practiſed by a great number of farmers in Norfolk, and which would become general in the three kingdoms, were it publicly known to be of the utility it really is.

As I was the firſt that proved its value, both by theory and practice, it gives me great pleaſure to ſee the method anſwer my moſt ſanguine expectations, and overcome the prejudices that were firſt raiſed againſt it. I make no doubt, but were this method to become general, that one-third more corn would be produced, than is by the preſent mode of random ſowing, beſides other advantages that would acrue both to the farmer and labouring poor.

This is no chimerical ſcheme, but real facts, which I ſhall literally and ſimply ſhow as they happened:— viz.

In 1764 I tried the experiment, and inſerted the reſult in my Yorkſhire-Farmer, publiſhed in the ſecond year, and have ſince continued the directions of management in all my editions, both of the New Syſtem of Huſbandry, and Eſſence of

Agriculture, which were circulated in England, Ireland, and America.

In conſidering the works of nature, through all the vegetable creation, and comparing them with the farmer's practice of ſowing I found many defects in the latter, which crampt the former from producing her abundance, but in nothing more than in that of ſeeding the ground, as, in moſt caſes, three-fourths of the ſeed is thrown away by the preſent mode of random ſowing.

Mr. Tull, and many other authors, had the ſame idea, which induced them to invent drill-ploughs, in order to reduce it to ſome ſort of a regular ſyſtem by drilling—but, with all their efforts it never could be made general.

When I came to conſider the whole proceſs, I found that even drilling was only half doing the buſineſs, as air, which keep the crop in health and vigour, can only circulate two ways; I therefore cauſed a machine to be made, to place the corn regularly in a diagonal form, it was finiſhed in 1764, for which the Honourable Dublin Society voted me a premium.

With this machine I proved the proper diſtances that the grain ſhould ſtand from each other, in order to give nature liberty to produce her full increaſe, but in theſe I found there is no general rule without an exception, but that circumſtances muſt vary according to the ſoil, which, if of a deep and rich quality, and kept clear from weeds, one grain, ſet in the middle of a circular foot diameter, will ſtool to fill the ſpace—but if the ſoil be of a weak, ſandy, or gravelly nature, a grain would only fill about ſix inches diameter; however, this is ſuppoſing every grain to happen nothing, but to come to maturity, which is too great a hazard to truſt to; therefore,

fore, experience has taught, that two, three, or even four grains in a hole are neceſſary, and may be productive of a ſure crop.

When a grain of corn vegetates, it appears with two blades ſticking together, till about three inches high, then it parts and falls flat on the ground, to each ſide of the root; at that period, it is what we call weaned from the kernel, and then begins to take its nutriment from the earth, whereas, the firſt two blades are, in fact, no more than the kernel or flower of the ſeed, turned into a green leaf; when this ſprings up, it leaves in the ground the huſks or bran, which may be ſaid to reſemble a blown egg, and theſe will remain, undecayed, even till after the corn is reaped. By thus obſerving minutely the progreſs of the plant, through all its ſtages, led me to find out the cauſe and preventive of ſmutty wheat, a malady well known among the farmers to be the deſtruction of many a good crop; having hit upon the cauſe, it was eaſy to find out an effectual cure, which I have done, is well known to numbers that have read my works, and I believe, I may ſay, I was the firſt author that ſo minutely and ſo largely treated on the ſubject, through all its ſtages of growth, from the ſeed to the ſickle— but to return to the ſetting: the ſeed plant which ſprings from the kernel, generally produces the ſtouteſt ſtraw, largeſt ear, and boldeſt grain, though indeed, all the ſucceeding ſhoots which ſpring from the ſides, may be good, yet, in general, they are not, but abate ſomething of the ſize of the ear and number of the grain of the firſt ſhoot.

Nature is very prolific, and will not fail of filling the ground, ſo long as ſhe can find food to feed the plants. The ear in the middle, which fills the kernel, will be the largeſt, and, if good land, perhaps, contain, from 90 to 100 grains; the next ears may abate ſomething of the number, and ſo on till they become very ſmall, perhaps, only a few grains in an ear; but, were any of theſe branches ſlipt off while young, and tranſplanted, they would ſtrike root and produce ears of a full ſize, according to the room given for the root to ſpread: this ſhews the true policy of putting a proper number of grains into each hole, two, three, or at moſt, four, is very ſufficient to produce a full crop—more would ſtarve the cauſe, by eating one another out; four dropped in a hole of an inch diameter, (which is generally the ſize of a ſetting ſtick) would have an outſide to give them liberty to fed round, and the ear, being the produce of the flower, as before obſerved, would be ſtrong, and the ſtraw ſtout to ſupport it; whereas, ſhould five, ſix, ſeven, or more, be dropped in the ſame hole, (and which is too often the caſe) they would draw each other up to be weak and dwindling, the inſide plants would ſuffer both for the want of food and air.

I have ſeen ſo many experiments of the ſort tried, that I am confident none can equal the method of ſetting corn at a proper diſtance, as before deſcribed, in order to produce a full crop.

Another great benefit that ariſes from the corn being ſet at an equal diſtance from each other is, that it can be quickly hoed, an operation very neceſſary to kill the weeds, lighten the ground, and give vigour to the plants, and is a buſineſs that may be performed by women, boys, or girls, as the ſpace between root and root is not to ſeek, being at a regular diſtance.

When my work made its appearance firſt among the Norfolk farmers, (which are ſome of the beſt in the kingdom) it was looked upon as a fooliſh chimerical ſcheme, and not likely to anſwer the purpoſe, within any reaſonable degree of expence, except it could be performed by a machine, ſuch as ſpike-rollers, &c. and, indeed, though I was well convinced of its utility, by the eye of reaſon, yet I was rather doubtful, that if it failed, this is the rock it would ſplit upon; however, experience ſoon proved the reverſe.

It is true, I found out the firſt principle by my machine, as is before ſpecified; but repeated trials ſhewed, that no complicated machine was equal to ſetting by hand.

About five years after my work circulated in Norfolk, buſineſs brought me to that county, and in an open field about three miles from Norwich, I was agreeably ſurprized to ſee ſeveral companies at work, ſetting wheat—this happened about twenty-five years ſince: I never heard any thing more of it till the preſent year, that I came to Lynn in Norfolk, where I went to the Crown inn with a company of gentlemen farmers, who moſtly followed that practice, and who all agreed, that it was a very valuable diſcovery, both to the farmers and the poor.

Having ſo good an opportunity of taking the ſenſe of ſo many reſpectable farmers as were preſent, I begged to know the particular advantage that accrued from this mode of ſetting, above all others they formerly practiſed, and if they were willing I ſhould report it to the honourable Board of Agriculture, or the Royal ſociety, in order that if the members of the ſaid board thought proper, they might inſert it in the public papers, for the good of the community in general; they ſeverally anſwered, they had no objection how public it was made, for it was well worthy of being communicated. I requeſted to know what the increaſe might be by ſetting, and the other advantages? To theſe queſtions I was anſwered as follows:—Firſt, that the produce was more, by ten or twelve buſhels an acre, than by the former method, particularly if the ſet wheat is hoed. Secondly, it is leſs liable to misfortune, ſuch as lodging, after heavy rains, mildews, &c. Thirdly, the ſtraw is ſtouter and the grain bolder, conſequently would give the beſt price. Fourthly, employing ſo many poor children, pariſh rates would be leſs.

As to the quantity of wheat that might be ſet in the ſeaſon, it may be judged of by the gentlemen, whoſe names are herein after ſpecified, which was given in writing by Mr. George Barber, one of the company, viz.

	ACRES.
Mr. John Barber, of Lunton, Norfolk, ſet	200

Benjamin

Benjamin Barber, Woodbaſtwick, Do. —	140
George Barber, Stanninghall, Do. —	100
Thomas Brown, Thrigby, Do. —	70
George Everit, Caiſter, Do. —	60
John Chriſtmas, Billockby, Do. —	100
James Burroughes, Eſq. Burlingham, Do. —	140
John Harriſon, Panxworth, Do. —	130
Thomas Saul, Blofield, Do. —	19
George Baker, Acle, Do. —	140

The laſt gentleman (Mr. Baker) has alſo ſet, by hand, a large quantity of barley, which is found to anſwer the purpoſe as well as wheat; ſo would oats and rye, as they are grain that multiply, if they have room given to ſpread.

If this method was become general, it would ſave an immenſe quantity of ſeed, and keep the poor employed from February to May; and, as experience has proved, paſt contradiction, the great utility of ſetting wheat in ſo extenſive a manner, might not the ſcale be extended—even through the three kingdoms?

CHAP. XXXII.

A Preface to Indian Corn.

THE preſent ſcarcity of corn ſtirs up the inventive ideas of thoſe in power to remedy the evil, and a temporary relief may perhaps be hit upon by giving a bounty on corn imported, and alſo opening our ports for foreign bottoms, &c. but we apprehend it will drain our country of ready caſh, and we ſhall ſtill be ſubject to the frowns of our enemies, and danger of the ſeas. Whereas, it is humbly conceived that plenty might be acquired in our own kingdom, and with much more certainty,

tainty, were the following ſchemes purſued with energy, as there is no doubt but they would be crowned with ſucceſs, viz.

1ſt. By incloſing and improving waſte lands, by which the kingdom would perhaps produce one-fourth more grain.

2d. By a general practice of Dibbling Corn, which would ſave to the kingdom one million of quarters in ſeed-corn, and which, by the preſent method, is thrown away to gain a worſe crop.

3d. By encouraging the general growth of Indian corn, its increaſe being amazingly great, and its management ſo eaſy, that it would produce abundance for every ſort of conſumption, whether for the human, or brute creation.

CHAP. XXXIII.

On Indian Corn, its Perfection, and how to raiſe it.

MUCH may be ſaid in favour of this grain, to prove its utility. In fact, it is the ſtaff of life to the common people of America, and all other countries where the climate ſuits; it is eaſy managed, done with little labour and dung; if dilatory people neglect to harveſt it in due time, it will take no damage by froſt, ſnow, or rain; as ſometimes it is let ſtand on the ground all winter; it does not require much barn room to thraſh it in; as women or children can do a great quantity in a little time, when ſitting at the fire ſide, by rubbing one ear againſt another, being the chief method of dividing the corn from the ſtraw; no time is loſt in winnowing, as it has no chaff; it is a ſtrong hearty food, and may be converted into ſeveral ſorts of diſhes, both for rich and poor, and at different periods of time, as for inſtance: Early in the ſummer, it makes a good diſh when eat young, as garden ſtuff, in place of green peaſe. It alſo makes a better haſty-pudding or ſtir-about, than oatmeal, and is as good a thickener for broth or gruel of any ſort. It is likewiſe a good ſubſtitute for beans, being a ſtrong feed for horſes, on which they work well; in ſhort, it is a quick fattener, and a ſweet feed for all ſorts of cattle, hogs, or poultry. Its blades or leaves are alſo better fodder than any ſort of ſtraw, particularly that which is ſtripped off when ſtanding green in the field, and which is generally done in the middle of ſummer, while growing in its full vigour, and tied up in ſmall ſheaves to be preſerved for winter uſe.

Adding to all theſe good qualities, the ſame quantity of ground will produce more refined matter than that of any other corn; it has often been known, that an acre has produced an hundred Wincheſter buſhels, but fifty or ſixty is a common crop. As all theſe are facts well known, the next queſtion is, whether or not the climate or lands of England is proper for the crop? they certainly are, for it has been raiſed and brought to as great perfection in England, as in America, as gentlemen have been known to raiſe it in their gardens, therefore what can be done on a ſmall ſcale, may be done on a large one, if managed in the ſame way. By perſevering in practice, things may be brought to perfection in England, which a few centuries ago was thought impoſſible.

In Queen Elizabeth's time, about 268 years ago, it was imagined garden ſtuff, ſuch as cabbage, carrots, turnips, onions, potatoes, &c. would not come to perfection in England, moſt of theſe articles were imported from the Netherlands in their days; but we now find that not only theſe, but even peaches and nectarines, can be brought to perfection ſo far north as Scotland; then why not India corn ſucceed here as well as in North America, about Boſton, Old York, Newbury-port, Portſmouth, and from thence to Maryland and Alexandria? The Climate does not differ ſo much as to make any material change in the growth, and the lands are made of the ſame ſort of materials, the country being variegated with ſand, gravel, clay, &c. as in England.

However, it is to be obſerved, that the ſame ſort of India corn which grows in general to the ſouth of Mary-land, will ſcarce ever come to perfection in the north of New England; neither is it of ſo good a quality. Five ſhillings per buſhel has been given for Indian corn that was grown near Newbury-port, when that could have been bought which grew to the ſouth of Alexandria for four ſhillings, therefore it is the North-country corn that we would adviſe to be introduced into England, becauſe the South-country grain would not ripen, conſequently would hurt the experiment, till people were acquainted with the difference of the growing quality, as both ſorts go promiſcuouſly by the ſame names of India-corn, India-wheat, or maize. However, a true judge will immediately ſee a material difference between the South and North-country corn; the former is a long white grain, not much unlike a hound's tooth in ſhape and colour, only thicker at the end; whereas the North-country corn, though in ſhape nearly like the other, is much ſhorter, and of a bright yellow caſt; but of this there are alſo two ſorts, viz. early and late; the early will come ripe three weeks or a month ſooner than the other, conſequently this is what is moſt proper to be introduced into England.

The difference of the grain cannot be diſtinguiſhed by the eye, but muſt be recommended by report of it being the earlier growth.

This corn does not grow near ſo high as maize, or that from the South-country, its chief height is only about four feet, whereas, the maize will riſe from ſeven to eight feet high, conſequently this dwarfy ſort may be planted nearer together than the other.

The South-country corn muſt have ſix feet between hill and hill every way, and the North-country only four feet between hill and hill in the rows, and five feet between each row.

They are called hills, though in fact they are not ſo, till raiſed by drawing the mould up to the roots of the corn, at three different periods, viz. firſt, when the plant is about ſix or eight inches high, and again, about a month after; and the laſt time when the topſails or downy parts are ſhot out, which is about a month more.

The moſt proper ground for this crop is that of a warm, ſandy, gravelly nature; it muſt be plowed and properly tilled for the purpoſe, after which ſow the ſeed, four grains in a hill, at an equal diſtance from each other, in a circle of about nine or twelve inches diameter, and cover the ſeed with about two inches of mould, provide rods with four and five feet marks on them, and as you go on ſetting the corn, lay the hills out four feet diſtance from each other in the rows, and five feet between the rows, meaſuring from center to center, the five feet ſpace will give room to plow between them to kill the weeds. Till the ground and make it fit for a crop of turnips, which may be ſown after the laſt earthing up the hills.

The ſpace between the hills in the rows where the plough cannot come, muſt be hand-hoed.

As the hills are at ſuch a great diſtance from each other, it is a good method to mix a ſhovel-full of rotten dung or aſhes in every hill, in ſuch a caſe a little manure will go far, and it immediately takes place to feed the crop.

The beſt time to ſet the corn, is from the latter end of February to the middle of March, earlier the better,

ter, when the weather is mild. The crop is fit to reap when the corn is hard in the ear, or the leaves or blades turn yellowiſh ; it is reaped with ſickles, like wheat.

Thoſe who have barn-room ſufficient may thraſh it on hurdles, but the moſt common method in America is, to take an ear in each hand, and rub the corn out one againſt the other; this is common, and may be done by women or children, as above obſerved.

Birds of all ſorts are fond of this corn, therefore great care muſt be taken that they do not deſtroy the crop as it comes up; this we were not aware of at firſt ſowing, in conſequence of which it was not guarded againſt.

CHAP. XXXIV.

A Pickle to prevent Birds from deſtroying Corn.

TAKE of old urine, three quarts, one quart of bullocks galls, one quart of train oil, one ounce of copperas finely bruiſed, mix all together, let it ſtand till the copperas is melted, ſtirring it often, ſteep the ſeed therein one hour, after which drain the liquor from it, and then take an equal quantity of ſoot and lime, and mix this with the grain, till it is candied over in the nature of a comfit, with as thick a coat as you can poſſibly get to ſtick. Proportion your liquor to the quantity of ſeed you have to ſow, and what ſpares reſerve for future uſe, as it improves by age.

This is alſo a good pickle for Engliſh wheat, to prevent the vermin from deſtroying it. We have known mice ſcratch to the grain, and leave it there without eating.

CHAP. XXXV.

Illuſtrations on Indian Corn or Wheat.

WE are to obſerve, that as Engliſh wheat is the king of all grains, for the finer palate of human ſpecies, ſo is this corn or wheat the king of all grains for the brute creation, as well as the ſtaff of life for the lower claſs of people, who are not bleſſed with means to procure the finer and moſt expenſive ſort; and indeed it ſeems as if nature purpoſely intended it ſhould, by its being ſo very prolific in its produce, which is ſo amazingly great, as almoſt to ſurpaſs belief.

It likewiſe ſeems as if nature deſigned it for the poor man's crop, by its being more eaſily managed than any other grain, and leſs liable to diſaſters of taking damage by bad harveſt when reaping.

Its ſtalks are ſo ſtrong, as not to lodge by overmuch wet, neither is the grain liable to ſmut or mildew.

It requires leſs labour in ſowing or tilling the ground than any other grain, for in point of ſowing, as there are only four grains ſet in the middle of every four feet, one perſon may ſet an acre in a day; and as only one foot ſquare in the middle of every four feet (in which the corn is ſet) need be manured, a load will be ſufficient for an acre; ſuppoſing only a ſhovel-full at four feet diſtance from each other, as it is not the great ſpace of four or five feet that are wanted for the roots to feed in, (for they do not ſpread ſo wide,) but it is to give circulation of air for the plants, which nature throws up in a tall buſhy top, and alſo to give liberty for the plough to go to till the ground and kill the weeds, which would ſtagnate the air; and likewiſe to prepare the ſoil for a crop of turnips, carrots, &c. which may be ſown even while the corn is growing, at Midſummer, as before obſerved, in fact, taking it in all its perfections, it is the moſt valuable grain extant. Engliſh wheat only exceeds it in its whiteneſs of flour and bread.

Indian wheat has every other advantage; it is a ſubſtitute for all other grain, in which it has been tried, except malt; and there is little doubt but it would make as good malt as barley, as it produces more flour, having no bran.

It is a beautiful ornament in a garden, at the ſame time it is bringing forth the ſeed; it ſupplies the place of green peas, and is much cheaper in ſeeding the ground; neither does it require ſticks to rod it like them, and in every caſe the ſame ground will produce much more refined matter than any other grain, owing to its being all flour, having no bran or huſk.

Indeed it is amazing that a grain of ſo great utility ſhould eſcape the notice of England ſo long; but the general fear was, that it being the native of a hot climate, it would not ripen here; however, it is now proved paſt a doubt, that there are two ſorts very proper, and will come to great perfection in England, but one will ripen three weeks or a month ſooner than the other, though ſown at the ſame time; there are other ſorts that will grow, but not come to perfection here.

The Author ſuppoſes he has taken an effectual method to eſtabliſh the proper ſort, it being raiſed from ſeed he himſelf brought from America, and as his ſubſcribers has both ſeed and directions how to raiſe it, he flatters himſelf it will ſoon become general for the good of community. He alſo has no doubt but good malt might be made from it; if ſo, the drink would doubtleſs have a better body than from barley, as it is all meal, and no bran or huſk; however, this is only ſuppoſition, but it certainly is worth a trial.

The produce is very great, ſometimes more than 3000 fold.

Perhaps, when it has good rich ground and tillage, it may produce three or four ears from one grain, and each ear will contain from 500 to a 1000 grains, therefore, ſuppoſe only one ear on a ſtalk, it cannot bring leſs than 500 fold.

Much leſs than one quart will ſow

an acre; however, this depends chiefly on the ſize of the grain; the dwarf or early ſort is the ſmalleſt, conſequently will take the greateſt number of grains to fill the meaſure.

A Copy of a Letter addreſſed to Sir John Sinclair, Bart. Preſident of the Royal Board of Agriculture, which was laid before them, and for which the Author had the Honour to receive the Thanks of the honourable Board.

SIR,

Having peruſed ſome of your remarks on one of the moſt valuable of all ſciences, (Agriculture) I cannot but admire your praiſe-worthy talents for improvement in a ſcience ſo intereſting to human nature, it being from the earth that living matter is ſupplied with nouriſhment; from hence, alſo, the philoſopher's ideas are more refined, by contemplating the works of Nature, it being a field that never can be exhauſted of ſubjects for fertile brains to try their talents in. In ſhort, the moſt refined ideas are the propereſt to make an improving farmer on. It is true, repeated experience, proved by length of time, finiſhes the work; but we muſt think before we act. Therefore, the ſtrong thinking philoſopher is the firſt mover of every ſcheme for improvement. If he be lucky enough, by depth of thought, to ſee with the eye of reaſon what will be the end of his new ſcheme, he will the quicker ſucceed in the enterprize; but if not, he may long row in troubled waters, twiſt and turn many ways to prove by dint of experience, before he arrives at the haven of ſucceſs.

Theſe ideas remind me of a paragraph I lately ſaw in a newſpaper of a ſcheme that was in contemplation

tion by the Agriculture Society; which was, to give a large premium for the beſt method of raiſing potatoes on any ſort of land; which, from my long experience in that branch, makes me doubt that the improvement will not be adequate to the expence, as this crop is well known already, eaſily managed, and I believe brought nearly to the height of perfection. I myſelf have been trying experiments thereon in England and Ireland 50 years, and have treated largely on the ſubject in all my books of huſbandry. I was the firſt that raiſed potatoes from the ſeed of the apple, which is now commonly done in Lancaſhire and other parts; and as growing them on land that never had them on before, has been long practiſed in Ireland; it is common there to give five or ſix guineas per acre for old graſs land that perhaps never had been broke up in the memory of man.

Potatoes will alſo come to great perfection in thin gravelly mountains, covered with ling, or a deep bog, if they have plenty of ſtable dung; in ſhort, they are not nice in the choice of the ground, provided they be ſuited with manure proper for the ſoil they are ſet in.

Were I capable of adviſing, it ſhould be to give premiums for ſome new crops not commonly known in England, and none has fallen under my obſervation ſo likely for ſucceſs as Indian corn; this I have repeatedly tried, and found to anſwer both in England and Ireland, but in the former rather the beſt; becauſe the land and climate is neareſt like to that in North America; about Old York, Newbury Port, Portſmouth, Boſton, Rhode Iſland, &c. are the places where the beſt in America is grown.

I have treated on the growth of Indian corn in my former publications, and given my reaſons why it is the moſt profitable poor man's crop extant.

The greateſt difficulty lies in procuring the proper ſeed, there being ſeveral ſorts which go under the denomination of Indian corn, but only two that would anſwer for this climate; therefore, the rock that this experiment would ſplit upon would be for want of the right ſort of ſeed at firſt, as a wrong ſort would throw a damp on the improvement.

I am, SIR,
Your moſt humble
And obedient ſervant,
C. VARLO.

Copy of a Letter from Sir John Sinclair, Bart., to Charles Varlo.

Sir,

Your letter concerning Indian corn was received and read to the Board; they are much obliged to you for this mark of your *attention.* When any thing ſimilar occurs to you, they will be received with pleaſure.

I have the ſatisfaction to inform you, that the Board requeſted me to convey you their thanks.

I am, Sir,
Your Obedient,
Humble ſervant,
JOHN SINCLAIR.

Board of Agriculture,
Whitehall,
Feb. 24, 1795.

To Mr. Varlo,
No. 2, Southampton Row,
New Road, Paddington.

CHAP. XXXV.

A new invented Threſhing Floor.

THOUGH this is a ſimple contrivance, yet it anſwers the purpoſe well, and any farmer may make it himſelf, viz.

Take deal boards two or three inches thick, and as long as will reach from one mow to the other, and as many as will cover the floor from door to door; then bore the boards full of holes with a taper tap-bit, ſuch as coopers make uſe of, and make them as wide as you think the corn will paſs freely through, but obſerve, that the holes be all tapered one way, and at about two inches diameter from each other. The bords being thus prepared, the next thing is, to provide three rows of truſſels, that will reach from door to door, and each truſſel muſt only have three feet in it, on which they will ſtand ſteadier than with four.

One row muſt go along the middle of the floor, and a row at each ſide; on theſe lay your boards cloſe to each other. Moſt floors are about 12 feet wide, conſequently the boards muſt be 12 feet long, therefore, one row of truſſels, as above obſerved, will be under the middle of the boards, and a row under each end. Lay the narrow part of the holes uppermoſt, by which the corn will never ſtop or clog up the holes, as it would do if the wide part of the holes were upwards; the upper part of the boards would be better to be planed; but if they be deal, and ſtraight cut, they need not be planed at the edge, as they will be cloſe enough without, and ſhould any corn drop through, it matters not.

The height or length of the feet of the truſſel depends on the farmer's choice; the higher the ſtage, the more corn the floor will contain under it, till the time of winnowing. When it is laid of an even thickneſs all over the floor, it will hold a great quantity.

The boards muſt not be nailed, but laid looſe, that they may be eaſy moved to one ſide, while the corn is winnowing on the bottom floor. If it be winnowed with the machine invented by this author 50 years ago, which may be known by going with a multiplying wheel, making a wind in a box, which winnows, riddles, and ſcreens at the ſame time; the ſaid machine may be worked in little room, and with great ſatisfaction.

The ſaid moveable floor may be quickly taken away to admit carriages coming in with corn, &c. as uſual.

CHAP. XXXVI.

The Perfections of the new-invented Threſhing Floor.

THE utility of this floor perhaps is greater than may appear on a curſory view, until its perfections hereafter are explained, viz.

The boards being looſe and hollow, rebounds with the ſtroke of the flail, and makes it riſe much eaſier than when it falls on a dead body, inſomuch, that a man may uſe a flail heavier, and by which he may threſh more corn, and with much more eaſe; and as the holes let the corn through, as ſoon as it parts the ſtraw, it, as it were, riddles the corn at the ſame time, and which ſaves much time and labour in making up the floor.

It likewiſe ſaves both loſs of corn and labour in ſhaking off the ſtraw, for by the preſent method, much looſe corn is thrown out with the ſtraw, for want of well ſhaking; but ſuch cannot happen with this floor, for it keeps itſelf clear from corn by the perpetual motion or ſhaking of the boards; and by being kept clear of corn, it threſhes cleaner and quicker than by the preſent method.

And to add to theſe advantages, the floor ſtanding perhaps three feet high, cattle, pigs, &c. cannot ſo eaſily run upon it, when the doors by chance are left open.

Another advantage is, that no barn room is loſt by corn holes being made as uſual under the mow, as the under floor anſwers for this purpoſe, and much better, as the corn lies thinner, therefore will not grow muſty, ſhould it lay longer than common without winnowing, which is ſometimes the caſe when it is new and ſoft, occaſioned by a wet harveſt, &c.

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